5

IO. BAPTISTAE PORTAE NEAPOLITANI

ELEMENTORVM CVRVILINEORVM LIBRI TRES.

In quibus altera Geometriæ parte reſtituta, agitur de CIRCVLI QVADRATVRA.

Ad Illuſtriſſimum Principem ac D.

D. FEDERICVM CAESIVM MONTIS CAELII MARCHION. II. &c. BARONEM ROMANVM.

ROMAE,

Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV.

Imprimatur si videbitur R. P. M. Sac. Pal. Apost.
Cæsar Fidelis Vicesg.

LIbros tres Elemẽtorum Curuilineorum Perillustris & Excellentissimi D. Ioannis Baptistæ Portæ Neapolitani, ex ordine Reuerendissimi P. Magistri F. Ludouici Ystella Sacri Palatij Apostolici Magistri perlegi, eosque cum nihil fidei, vel moribus aduersum continere inuenerim typis dignos existimaui. Romæ Die **20.** *Iulij* 1610.

Antonius Bulius Fauentinus Ciuis Romanus Philosophiæ & Medicinæ Doctor.

Imprimatur. Fr. Damianus à Fonseca magister, & Socius Reuerendissimi P. Magistri Fr. Ludouici Ystella, sacri Palatij Apostolici Magistri, Ordinis Prædicatorum.

In Clariſſimum ac Doctiſſimum Virum

IO. BAPTIST. PORTAM NEAP. LYN.

& in librum de Circuli Quadrato.

Ioannis Demiſiani Cephallenienſis D. Philoſophi ac Theologi.

Ἦμος ἑοῖς ἐπέεσσι πολύχροα Δαίδαλα ΠΟΡΤΗΣ
  Φαίνει, τοῖς θαλέθει γαῖα πυκαζομένη.
Οὔατι θαμβαίνουσα βιαρκεῖ μῦθον ἀκούει,
  Καὶ σφετέρης γαίης φθέγγεσιν ἀγλαΐης.
Ἀξυνέτου βάζοντος ἀπείρεα θαύματα πόντου,
  Σιγαλέη πόντος νηνεμίη γαλάᾳ.
Ἠέρος αἰγλήεντος ὅταν χύσιν αὐτῆς ἐνίσπει,
  Ἴσον ἀπαστράπτει δώμασιν οὐρανίων.
Αἰθέρος ἀστροχίτωνος ἀπείρεα νῶτα πιφάσκει,
  Καὶ Πόλος ἠρεμέων οὐδ' ἑτέρωσε θέει.
Κύκλα δὲ, καὶ Τετράγωνα, Τρίγωνά τε, Πρίσματα, Κώνους,
  Καὶ γραμμὰς μετρεῖ, κέντρα τε πυραμίδων.
Ὅσσα τε πὰρ Νείλου προχοῆς μητίσατο τέχνη
  Ἄπια δαιτρεύων Ἠερίης ναέτης.
Αὐτήνικα Σοφίη πολυμήχανα δήνεα τίει,
  Ὕδωρ πρηῢ ῥέον Νεῖλος ἐρυκακέει.
Ἔδρακε γὰρ Τετράγωνα πάρος πολεμήϊα Κύκλοις,
  Ὅρκια συνθεσίης, καὶ φιλίης ταμίειν.
Ἔδρακε, καὶ θάμβησεν ὅπερ χρόνος ὀψὲ φαείνειν
  Ἤμελλε, ζαθέων ἠὺ τέκος πραπίδων.
Ἄλλον ἐγὼ Κρονίδῃ δώσω πολυΐδμονα ΠΟΡΤΗΝ,
  Ἣν ἡμῖν ἄλλην Παρθενόπην ὀπάσῃς.

FRANCISCI STELLVTI
FABRIANENSIS
LYNCÆI.

Vidimus innumeras mutantem Protea formas;
Credite, nam veri Nuncia Fama canit.
Tortilis en Orbis species se vertit in omnes,
Et QVADRVM teretes efficit arte rotas.
Dicite Pierides quo tandem munere factum?
Aut nostro, aut PORTÆ. visq. laborq. pares.

ILL.

ILL.^{MO} PRINCIPI AC D. D.

FEDERICO CAESIO MONTIS CAELII MARCHIONI II.

Io. Baptiſta Porta Neapolitanus. S.

CERTAMVS inter nos, Illuſtriſſime Vir, tu beneficijs, ego officijs; quibus ęquo animo vel vincar abs te, vel, ſi fieri poſſet, vincam te. Et ſanè grauis iſta contentio nullum vnquam finem habitura videtur. Summis me ornas laudibus, meos libellos plauſu, nedum honore proſequeris, &, quod caput eſt, iacentes aliquando, ac mox improborum impetu proterendos; erigis & defendis; quæ quidem merita ita in memoria inſederunt mea, vt mei ipſius potiùs, quam illorũ erga me magnitudinis obliuio capiat. Ego verò ſi titulos percenſere velim, quibus tuũ animum virtus cohoneſtauit, ſplendorem domus, quam

„ Bellipotens illuſtrat Auus, Tu fulcis, & ornas.

aliaq. ornamenta, quibus te natura mirificè cumulauit; & vires, & vita me deficeret. quid? ipſam Inuidiam ad maxima quæque, ac pulcherrima labefactanda natam, virtute ſuperaſti.

„Eſt

,, Est aliquod meriti spatium, quod nulla furentis
,, Inuidiæ mensura capit.

Sed non est animus in præsentia laudes enumerare tuas. maioris id molis est. leuiter, at amanter tetigisse satis; neque enim qui Cœlestium Orbium ornatum in parua describunt tabella, de illorum pulchritudine quicquam demunt; parua, vt ita dicam, sed concinna magnitudo. Quid igitur mirum si certos fines, terminosq. huic suauissimæ concertationi non constituo? Non patitur mea in te obseruantia Victoriam. Tu, quæ tua est magnanimitas, cedere nescis. Esto lis sub te Iudice. Tu te vince

,, Inq. animis hominum pompa meliore triumpha.

meum certè quidem tibi deuinxisti, ac deuicisti. Non excitabo testes ex monumentis, quæ in manus peruenerunt Sapientum. Sit hic liber tuo insignitus nomine, amoris, ac venerationis in te meæ pignus sempiternum. Circulum quadrare conatus; rem scilicet aggressus in eruditorum identidem commemoratam comitijs; in Philosophorum agitatam scholis, in Mathematicorum iactatam iudicijs. Multos in hoc Theoremate me labores exantlasse, curas, & cogitationes euigilasse meas; ac pertinaci industria desudasse, non inficias iuerim. An verò modum quadrandi Circuli inuenerim, sicq. præmium, & fructuum meorum cœperim laborū, non facilè statuerim: Id saltem assecutus mihi videor. Latissimum aperuisse campum ad meliora vel inuestiganda, vel inuenienda: Verecundè tamen dixerim, plurima nos excogitasse, multa in disquisitionem vocasse,

caſſe, ſuisq. examinaſſe ponderibus, quæ nemo vſque in hodiernum diem odoratus quidem eſt. Immo, vt id quod ſentio, aperiam, opus magnis viris tentatum, ac tandem deſperatum, aut inchoauimus, aut perfecimus. nihil tamen in tanto, ac tali negocio pro certo affirmarim, te, non aſſentiente, tuæ enim Παλλάδος ὑπὸ πτερῖς ὄντας ἄζοντ' βροτοί. tuo iudicio, ac patrocinio fultus, non morabor τοῖς γεφυρισταῖς. Tenes, opinor, memoria, incomparabilis vir, Epheſiorum factum. Illi dum hoſtili vexarentur bello, de rei euentu conſuluerunt Oraculum. datum reſponſum, ſi Rempublicam ſartam tectam cuperent, ad Tutelaris Numinis Templum Vrbē alligarent; quo peracto, hoſtes in fugam verterunt, Epheſumq. obſidione, ac metu liberarunt. Multi iam cogitant noſtra obſidere inuenta, machinas admouent, ac penè labefactant: ſed meus Apollo dudum me commonefecit, vt me meaq. tui Genij vinculis obſtricta, aduerſariorum impetus reprimam, ac frangam. Tuere igitur, Heros, litterarum, ac litteratorum Cenſor, quæ tibi dicata ſunt, eo vultu, quo intuentium allicis animos. Habes à Philoſophia non minora clementiæ, quam iudicij præſidia, vt illa nouos hoſce foueas conatus, hoc vt defendas. Vale, tecumq. creſcat tuæ Gentis ſpes, Patriæ columen, litterarum decus, meæ Neapoleos amores, Italiæ gloria. Kal. Iulij M.DC.X.

AD LECTOREM PRAEFATIO.

NON immeritò, Candide Lector, admirari satis non possumus de viris quibusdam omni doctrinæ genere cumulatis, qui, cum mathematicas tractationes sibi assumpserint, atque in ijs cum laude versati, sint, de illa parte, quæ curuas complectitur lineas, nihil ferè commentati, aut meditati sint. In quadrando quidem certè Circulo (re scilicet æquè decantata, atque ardua) plerique ingeniosi viri desudarunt, & elaborarunt rectè ne, an secus, ipsi viderint. Ego qui noui aliquid moliri, non aliorum labores veluti fucus surripere studeo, eandem quidem subiui aleam. Sed vt legitimè & expeditius id præstarem, multa ex Euclideis elementis ad propositum argumentum transtuli, ac plurimas confeci demonstrationes, ex quibus, aliquas, quæ ad rem facere videntur se legi, easq. vti curuilinearum figurarum elementa proposui. Hinc ad perdifficilè Theorema de quadrando Circulo, progressus sum. quid vero effecerim in re multis circunfusa tenebris, & in quà summorum virorum ingenia errare potius, quam hærere visa sunt, aliorum esto iudicium. si perfectionem non sum omnino assecutus, conatus certè, & adumbratio tanti Theorematis laudandus.

IO. BAPT. PORTAE NEAPOLITANI

ELEMENTORVM CVRVILINEORVM Liber Primus.

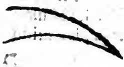
DEFINITIONES.

PRIMA.

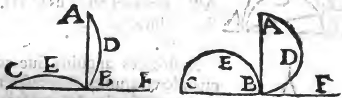
LINEA curua est, quæ inter sua nō æquè fluit puncta, sed facto sinu flectitur.

II.

Angulus flexilineus est flexarum linearum retusio suo nutu sibi coincidentium.



III.

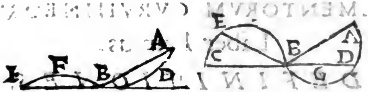


Angulus flexilineus rectus, qui rectilineo respondet.

Exempli causa sit A.B.insidens linea iacens FBC. vtrobiq. sibi æquales constituens angulos ABF, ABC. sitq. AB. ipsi B. C. æqualis & ipsi AB.hemicyclium circumscribatur ADB.vel circuli portio, & ipsi BC. alter B. E C. vel æqualis circuli portio. Cyclogoni ergo DBA. CBE. sunt æquales, & quanto angulus AD.B.F. maior est recto ipso contingentiæ angulo DBF. tanto ABE. superat ipsum ABC. altero contingentiæ angulo ABE.

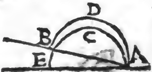
totus igitur A D B E C. toti ABC. recto æqualis, vt probauit Proclus in Eucl.

IIII.



Obtusus curuilineus, qui obtuso rectilineo fit quando à recto resupinata in maiorem angulum abit.

Eodemq. modo angulū ADB.FE. flexilineum, rectilineo ABE, esse æquale flexilineus angulus F.B.E est æqualis flexilineo DBG. nàm æquales sunt circulorum portiones, si angulum DBG. abstuleris, & reposueris supra EB. erit rectilineus DBE. æqualis flexilineo DGBFE.

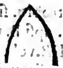


Sic etiā semicirculus ADB. æqualis est A C E, dematur portio communis ABC. remanet angulus CAD. æqualis rectilineo BAE.

V.

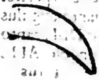
Xystroides angulus siue concauus quando vtrarumq. circumferentiarum caua extra fuerint, & intus se respiciens conuexitatibus suis.

VI.



Contra conuexus angulus quando circumferentiarum conuexa vtrinq. extra fuerint, & inter se suis finibus aspexerint.

VII.



Angulus μηνοειδὴς siue lunaris, qui ex caua conuexavè circumferentia fuerit, vt conuexum vnius alterius conuexitatem aspiciat.

Cys-

VIII.

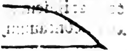
Cyssoides Angulus ex hederæ folijs nomen indeptum ex gibbosis, cauisq. lineis constat ad punctum vnum conuenientibus, vndatim contra se discurrentibus veluti Vndulatus.

IX.

Mixtus angulus, qui ex rectis circulosisq. lineis componitur.

X.

Cyclogonus, qui à Caua, & recta circuli circumferentia constat.



XI.

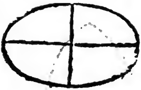
Κερατοειδὴς. siue in cornua falcatus, quando rectæ opponitur conuexa nostri contingentiæ vocant.

XII.

Figura vel angulosa, vel agonia, agoniarum figurarum circulus princeps, lineæ partem, quæ ambitiosè circumuoluitur, & aream obambit concauum dicimus, quæ extorsum inuehitur conuexum.

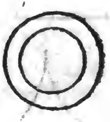
XIII.

Sphærois siue Ellipsis ex ambienti linea in se recursa describitur vnius duæ diametri, longitudinis vna longior, latitudinis altera ad rectum in medio se secantes.



XIIII.

Vertex. siue corona est duorum circulorum concentricorum circumcursus.



XV.

Angulosarum figurarum metriscus siue

lunula prior, eſtq. in eaſdem partes caua habentibus comprehenſa circumferentijs figura.

XVI.

Trilaterarum figurarum flexilinearum triangulum primum eſt, quod tribus conſtat ijſdem æqualibus circumferentijs circuli, idq. conuexum, concauum, vel mixtum.

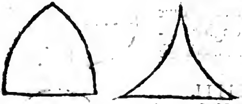
XVII.

Iſoſcele triangulum curuilineum, quod duabus tãtum æqualibus circuli circumferentijs continetur, idq. etiam cõuexum, vel concauum, vel mixtum.

XVIII.

Scalenum flexilineum eſt, quod tribus inæqualibus circuli circumferentijs clauditur, ijsq. cauis conuexis, & mixtis.

XIX.



Semicuruilinea triangula ſunt, quæ ex rectis, curuiſq. circumferentijs continentur.

XX.

Tricuſpidatum triangulum, ſiue acio idea quadrilaterum eſt triangulum quod tres habet acutos angulos.

Inter

XXI.

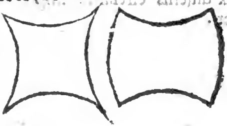
Inter triangulares figuras πελεκοειδής. Figura est, quæ securis vel bipennis formã habet.

Eius Theocritus meminit. Nicandri Scholiastes sutorium scalprum. Τὰ κυκλοτερῆ σιδήρεια, οἷς οἱ σκυτοτόμοι τέμνουσι καὶ ξύουσι τὰ δέρματα. Ideſt circularia ferramenta quibus pelles incidunt, & deradunt.

XXII.

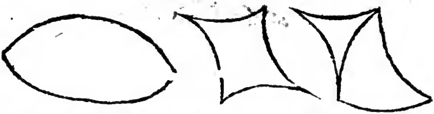
Arbilones ex tribus circumferentijs compræhensi; Horum meminit Pappus spatium illud inter circumferentias interiectum ἄρβηλον vocans.

XXIII.



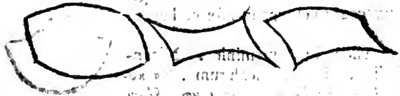
Quadrilaterarum quidum figurarum curuilinearum quadratum quidem flexilineũ est, quod rectis angulis, & æqualibus circumferentijs perscribetur.

XXIIII.



Rhombus flexilinea æquilatera quidem, sed non rectangula, aduersos tamen angulos æquales habet, eorumq. aliquos concauos, conuexos, & mixtos.

XXV.



Rhomboides vero neutrum horum habet neque laterum, neque angulorum æqualitatem, ſed contrarias circumferentias, & angulos æquales habet ſimiliter etiam concauus, conuexus, & mixtus.

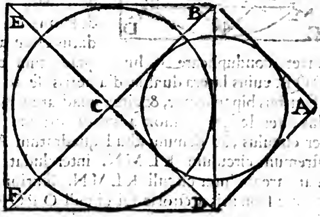
XXVI.

Trapezoides curuilineum, quod quatuor inæqualia latera ex diuerſis circumferentijs habet.

PROBL. I. PROP. I.

Datum circulum duplare.

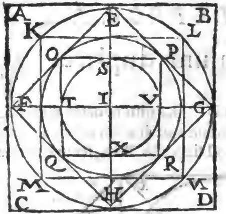
SIT datus circulus ABCD. cuius oportet duplum inueſtigare. Deſcribatur quadratum per 7. 4. Eucl. & ſit ABCD. ducto Diagonio BD. ſecundum datum BD. deſcribatur quadratum per 48. 1. Euclidis, & ſit BEDF. cui circulus inſcribatur per 6. 4. dico circulũ BDFE. eſſe dati duplum.



Hanc conſtructionem demonſtratione fulciendam rati ſumus. quoniam BCD. rectus eſt angulus proinde cum quadrata lateris BC. CD. æqualia ſint quadrato ex BD. ex 47. 1. ergo quadratum ex BD. duplum quadrati ABCD. ſed ex BD. deſcriptum quadratum eſt DBFE, ergo quadratum BDEF. duplum ipſius ABCD. ſed circulus ad circulum eandem rationem habet, quam quadratum inſcriptum, aut circumſcriptum, vt ex Euclidea demonſtratione ratum eſt duodecimi elementorum ſecunda, ergo circulum ABCD. duplauimus per circulum BEFD.

Plato ita quadratum duplat vt à Vitruuio annotatur. Dimidium quadrati BDC. eſt quarta pars quadrati BEF. ergo quadratum BEDF. duplum eſt ABCD.

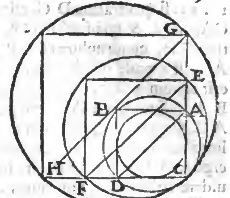
Poſſu-



Possumus, & alio modo circulos duplare, si circa datum circulum quadratum induxeris, & post circa quadratum circulum, & circa circulum aliud quadratum eodem modo alios circulos semper duplicabis. Sed quo iuuenes rectius imaginari, & capere possint exemplo duximus declarandum. Esto datus circulus STVX. quem oportet conduplicare, huic quadratum circumstruemus O P Q R. cuius latera duabus diametris se ad centrum I, decussantibus bipartiemur, & circa quadratum O P Q R. circuculus alter designetur mox aliud quadratum. K. L. M. N. & alter circulus, ac demum aliud quadratum A B C D. quod postremum circulum K L M N. intercludat. His perstructis aio aream inter circuli K L M N. finitionem concludam proximè sepientis arctioris sui circuli O P Q R. duplam esse, vt laxior postremi area eius, qui minimum intercludit quadrupla sit, & sic in infinitum duplare possumus cuius veritas hac demonstratione repræsentabitur. Quoniam linea A B. bifariam diuisa est in E, quadratum A B C D. quadruplum est ipsius A E, & sic in quatuor quadrata æqualia A I, E G, F H, I D. & hæc à quatuor diagonijs bifariam diuisa sunt E F, F H, H G, G E, quatuor igitur triangula extrinseca F A E, E B G, G D H, H C F. quatuor interioribus æqualia sunt; ergo totum quadratum A B C D. quadrati E. F. G. H. duplum erit, eademq. ratione quadratum E F H G. ipsius O. P. Q. R. duplum erit, & primum A. B. C. D. huius quadruplum.

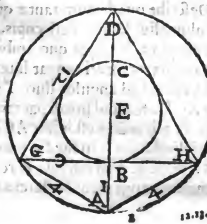
Anni-

Annitemur etiam per quadrata dupla ambientia idem rimari, & absoluere. Esto datus circulus A B C D, cui quadratum ABCD. circumstruimus: mox ab oppositis angulis ducto diagonio AD & à puncto C, superne versus A, signa lineam eiusdem longitudinis ipsius AD, & sit C E, & ex parte inferiori sit C F, mox trahe diagonium E F; & iterum quanta E F, figura in linea C G, & inferne linea CH, & id toties repetendum quoad satis videbitur. Sic quadratum ex GH, duplum est quadrati E F, & quadratum E F, duplum AD, & AD, duplum AC. Sed quod exprimit figura, demonstremus. Quoniam quadratum AD, est æquale quadratis A C, C D, & AC, CD, latera æqualia sunt, ergo quadratum ex A, duplum est quadrati AC, sed AD, est æquale EC, ergo quadratum EC, est duplum AC. Sed quia E F, est æquale duobus quadratis EC, CF, & EC, C F, æqualia sunt, ergo quadratum ex EF, duplum est EC. Eodem modo GH, duplum ipsius AC, & si idem varijs modis assequi posset, tanquam suffecturos reliquos censuimus missos facere.



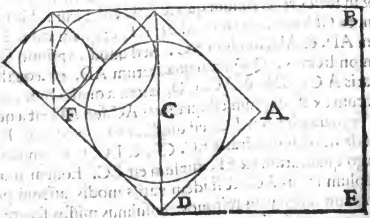
Libet non prætermittere, alium quadruplandi modū.

Sic circulus B C, quem intendimus quadruplare circa quem æquilaterumtriangulum per tertiam quarti describamus, & circa illud alium circulum per quintam eiusdem quem quadruplum pronunciamus. Quoniam DG, tripla est ipsius GA. ex



oh

12. 13. si quadratum D G, erit duodecim partium talium GA, erit 4. & quadratum G B, erit talium 3. nam quadratum G D, quadruplum est G B, suæ dimidiæ, sed quadratum AG, est æquale quadratis GB, BA, igitur si quadratum G A, erit talium 4. & quadratum GB, talium 3. erit quadratum B A. talium I, sed A E, erit quatuor, quoniam est æqualis A G. & quando quadratum totum 4. est, & sui pars 1. erit linea per medium diuisa ergo AB. ipsius AE. dimidium erit, ergo tota AD. ipsius EB. quadrupla est. Si vero circulum diuidere voluerimus, poterimus conuersa vti operatione. Et si facilia quidem sint, quo tyrones iuuemus alium modum apponere non pigebit.



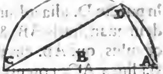
Describe quadratum tantæ quantitatis quantæ duplarem circulum diuidēdum fieri cupis, & sit ABCDE. cuius medio fige punctum A. super quo ambitiosa linea circumducatur, quæ omnia quadrati tangat latera, deinde annecte literas rectas à centro ad angulos duos AC, CD. & constitue triangulum ACD. & aliud priori par triangulum constitue cuius angulus F. erit rectus est igitur ACDF. secundum quadratum primi dimidium. In medio puncto huius diagonij CD, qui sit G. pone pedem circini, & reliquo vago describe circumferentiam tangentem sui latera quadrati ACDF. & hoc modo

do in infinitum poteris circulos dimidiare. Demonstratio ex superiori pendet.

Datum circulum triplicem quintuplicem, & septuplicem reddere.

Prob. 2.

SIT dati circuli diameter AB. quem volumus triplare elongetur AB. in C. & sit AB. æqualis BC. & fiat circulus ex diametro A C. & sit AB. æqualis A D. quæ in circulo locetur per primam 4. Euclid. & ducatur DC. dico circulum ex DC. diametro circuli ex AB. tripli esse cuius demonstratio ex 12. 13. lib. Eucl. pend.



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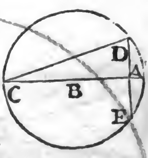
Si vero quintuplare voluerimus sit data diameter AB. circuli quintuplandi. Elongetur quantum AB. & sit BC. circumducatur ei circulus A D C. in quo pentagonum æquilaterum inscribatur per 9. 4. Eucl. & sit linea subtendens duobus lateribus DC. pentagoni latus AC. dico quadratum DC. DE. simul iuncta quadrati AB. quintuplam esse. Demonstrationem quære ex 12. 13. Euclidis.



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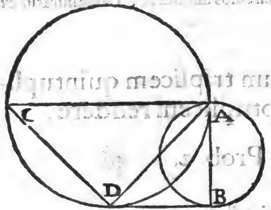
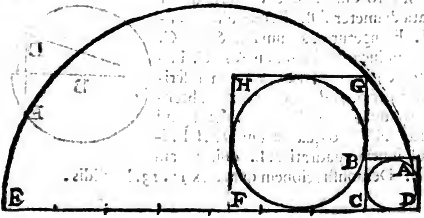


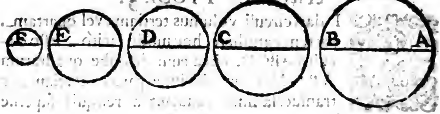
At is modus, vniuersalior, & commodior visus. Sit datus circulus A B. dimetiente descriptus, volo tergeminum reddere. Puncto igitur B. ipsius lineæ A B. ad rectos angulos adiungatur D B. paris quantitatis. Mox trahatur AD. dein ipsius lineæ DA. in puncto D. alia adiungatur DC. ad rectos angulos, & eiusdem quantitatis AB, & ducatur CA, & dimetiente CA. fiat circulus, qui AB. circuli tergeminus erit. Quoniam potentia lineæ AC, potentia linearum AD. DC. sibi vendicat, & AD. ipsas AB. BD. igitur AC. valet tres circulos, cuius inest A B. Quod si quintuplare, aut per alios impares numeros multiplicem reddere voluerimus: Addemus puncto C. lineam alteram ad pares angulos quantitatis AB. & erit quintupla ipsius AB.

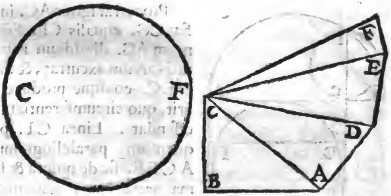


Possumus etiam si velimus alio modo idem exquirere.

Sta-

Statuatur circulus A B C D. septies multiplicandus cui circumducatur quadratum, & latus eius producemus, illudque in octo partes diuidemus, cuius principium D. finis E. mox DE. per medium diuidatur in F. positoq. circini pede in F. & alio DF. circumducatur quousq. semicirculum absoluat DE. & latus C. B. quadrati producatur vltra B. in continuum, rectumq. ad arcum DE, & vbi eum contingit, illic scribe literam G. & ex CG. fiat quadratum CGHE. in quo circulus inscribatur, qui continebit septies ipsum BACD. Quoniam CG. est media proportionalis inter EC. CD. igitur per 13. 6. Euclid. vt EC. prima ad tertiam CD. ita GH. quadratum secundæ ad BD. quadratum tertiæ per 20. 6. Est autem EC. per constructionem septupla ipsius CD. igitur quadratum HC: septuplum ipsius quadrati BD. quod probandum assumpsimus.



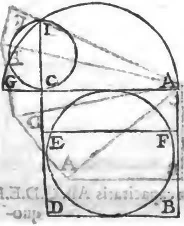


Sint positi quini circuli diuersæ capacitatis AB. C.D.E.F. quo-

quorum quantitates volumus singulari circulo comprehendere, quod ita propemodum faciendum existimamus. Esto enim circuli diameter AB. constituatur ad rectos angulos ei BC. mox ducatur linea ab A. ad C. & hæc dimetiens potest binos circulos AB. C. Porrò puncto A. lineæ AC. recta linea erigatur ad rectos angulos, quæ sit AD. & à puncto D. trahatur linea D.C. & hæc dimetiens est capiens tres circulos AB. C. D. ipsi demum CD. recta linea ad rectos erigatur DE. quarti circuli dimetiens potens quatuor circulos. Postremo ei lineæ EC. ad rectos iterum excitetur quinti circuli EF. trahaturq; per FC. dimetiẽs, capiẽs iam cunctos circulos, & hoc modo omnes licet quotquot volueris comprehendere. Demonstratio habetur ex penultima 1. libri Euclidis.

Ex dato circulo datam partem subtrahere. Probl. 3.

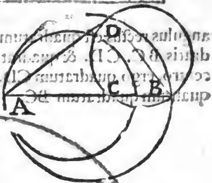
SI dati circuli volumus tertiam, vel quartam partem extrahere, hoc modo facito. Esto circulus ABCD. circa eum describe quadratum ABCD. cuius abscinde partem tertiam, ac transuersa linea conuenit à reliquis supernè distinguere FE.



Procurrat igitur AC. in G. & fiat CG. æqualis CE. supra lineam AG. dimidium rotunditatis arcum excurrat, & linea DEC. eousque producenda erit, quo circumferentiam in I offendat. Linea CI. potest quantum paralellogrammum ACFE. sic de quinta & septima parte cuius demonstratio ex vltima secũdi depẽdet Eucl.

Datis

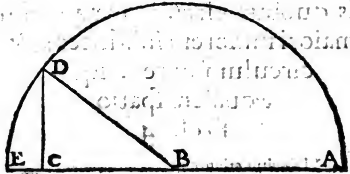
Datis duobus circulis inæqualibus à maiori minorem ſubducere, & circulum dare reliquo æqualem ſpatio. Probl. 4.



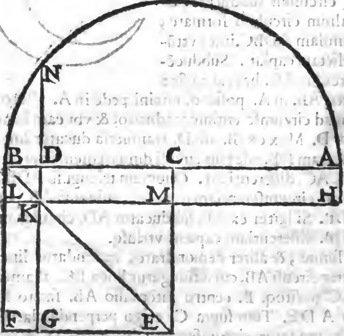
SVbducitur etiam circulus minor à maiori, & circulus etiã formari poteſt, qui vtriuſque differentiam capiat. Eſto maior circulus ABD. volo ab eo circulum ſubducere, ac mox alium circulum formare, qui lunulam ADBC. inter vtrũque relictam capiat. Subducẽdus circulus AC. hæreat in fine diametri AB. in A. poſitoq. circini pede in A. altero ad C. vagum ad circumferentiam traducito, & vbi eam incidit, ibi locetur D. Mox ex B. ad D. tranſuerſa ducatur linea DB. Dico lineam DB. eſſe eius circuli dimetientem capientem inter AB. AC. differentiam. Quoniam trianguli ADB. angulus D. ad circumferentiam rectus eſt, ſubtenſa AB. poteſt, vt AD. DB. Si igitur ex AB. ſubducatur AD. circulus, remanet alter DB. differentiam capiens vtriuſq.

Poſſumus, & aliter demonſtrare. Extendatur linea AB. diameter circuli AB, cui adiungatur linea BC. diameter circuli AC. poſitoq. B. centro interuallo AB. facito ſemicirculum ADE. Tum ſupra C. erigo perpendicularem CD. quouſq. tangatur circumferentia in puncto D. & connecto BD. Dico CD. eſſe quęſiti circuli diametrum. Quoniam C.

angu-



angulus rectus est quadratum subtensæ BD. æquale est quadratis B C. C D. & quadratum BD. est æquale AB. quia ex centro, ergo quadratum CD. tanto minus est quadrato BD. quantum quadratum BC.

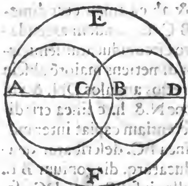


Quod si voles alio modo efficere hac ratione assequeris. Sit

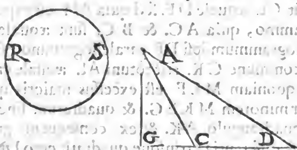
Sit dimetiens maioris circuli CB. & ab ea amputetur dimetiens minoris circuli CD, & linea B C tantundem extendatur ad A, & puncto C facto centro circumducatur semicirculus ANB.& à puncto D,vbi minor dimetiens maiorē abscin dit, erige super transuersam AB ad rectos angulos DN. & vbi DN periferiam secat ANB. istic pone N.& hæc linea erit dimetiens circuli inueniendi,qui differentiam capiat inter maiorem,& minorem circulum. Ex linea BC. describatur quadratum per 46. p.E. & sit CEBF. ducaturq. diagonium B E. & per D punctum descendat paralellas ipsi BF. sitq. DG. secabitq. diagonium in K & per K signum exciteтur alter paralellus ad AB, & sit HMKL. & ex A ad H ducatur alter paralellus ipsi C M. Quoniam supplementum C K. supplemento KF. per 43. 1. est æquale, addatur commune quadratum D L. erit CL æquale D F. sed quia AM est æquale MB paralellogrammo, quia A C. & B C. sunt æquales, ergo AM paralellogrammum ipsi DF paralellogrammo est æquale, addatur commune C K. erit totum AL æquale gnomoni M L F. sed quoniam M L F est excessus maioris quadrati CBEF. super minorem M K E G. & quadratum lineæ D N est æquale quadrangulo A K. & ex consequenti gnomoni MBF quæ est differentia vtriusque quadrati; ergo DN circulus est differentia duorum inæqualium circulorum, quæ erat demonstrandum.

Datis tribus circulis,duos à maiori, qui duobus circulis laxior sit, subducere, & circulum dare reliquo spatio æqualem. Probl. 5.

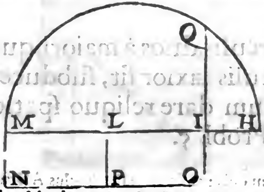
SIT amplius qualem quis conficere velit circulus ADEF. sintq. pro arbitrio bini circuli A B. C D. quorum areæ



totam non contineant continentis amplitudinem, & ij vel in se ipsos flexi, vel mutuo intercisi, vt in exemplo, volo constringi circulū, qui reliquum spatium contineat, scilicet interceptum vacuum. Ex tribus AD. DC. BA. fiat triangulum ACD. quod obtusum erit producaturq. alterutrius maioris circulatus, videlicet DC. eousque sit productionis meta, quousque à trianguli supercilio, quod prædictæ lineæ incumbit, linea



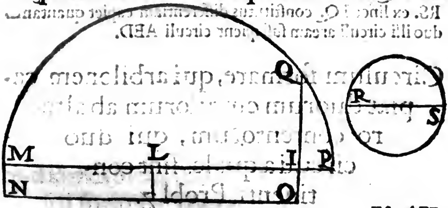
ad perpendiculum descendat, sitq. AG. His perfectis extruatur paralellográmum, cuius productus latus sit ex CD. geminata, & sit ML. LI. breuius ex CG. sitq. MN. IO. & producatur MI. donec æquetur IO. & sit IH. & extremæ lineæ ora terminentur per

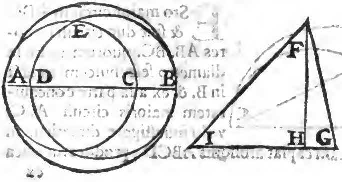


circuitionis arcum MQH. elongeturq. OI. inferaturque coeun-

coeunti lineæ cum arcu litera Q. sic ex linea DQ. fiat circulus R S. capiens iam dictam differentiam. Quoniam angulus ACD. est obtusus, quadratum lineæ AD maioris circuli superat quadrata DC, CA, minorum circulorum per rectangulum comprehensum ex DC. & CG. bis per 12. 2. Euclid. & ex his constitutum rectangulum MI, & diameter QI. capiet comprehensam aream, ex qua circulus RS. quæsitam differentiam continebit.

Datis tribus circulis duos à maiori, qui duobus circulis angustior sit, subducere, & circulum dare reliquo spatio deficienti æqualem. Probl. 6.

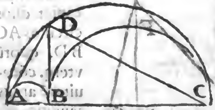




Esto AEB. circulus, qui capiet duos circulos AC BD. quorũ vterq. cõcauitatẽ arcus capiẽtis cõtigat, fuisq.

arcis continentis areã excellant, vestigandus estcirculus, qui differentiam excellentis areæ excipiat. Fiat triangulum ex tribus lineis AB. AC. DB. per 22. 1. Euclid. & sit G F I. qui erit acutus, cadat ex apice F. trianguli in substratam basem GI. orthogonaliter linea FH. & vbi eam abscindit, illic fige literam H. Porrò ex geminata base GI. & linea GH in se ductis, fiat paralellogrammum MO. & superior linea MI procurrat quousque sit æqualis IO. & sit P. Mox partire interuallum MP. per æqualia in D. & ex D centro describe semicirculum, elongeturq. linea IO. quousq. attingat arcum MP. in Q. & IQ dimetiens erit futuri circuli quæsitam differentiam capientis. Quoniam quadratum FI. minus est FG. GI. quadratis tantum, quantum rectangulum bis sumptum ex linea IG. GH. per 13. 2. Euclid. quod erit NI. & linea IQ. erit dimetiens continens aream NI. circulus igitur RS. ex linea IQ. constitutus differentiam capiet quantam duo illi circuli aream suscipient circuli AED.

Circulum formare, qui arbilonem capiat duorum circulorum ab altero contentorum, qui duo circuli æquales sint continenti. Probl. 7.



Esto maior circulus ADC & sint duo circuli minores AB. BC. quorum arcus in diametro sese inuicem tangãt in B. & ex alia parte concauitatem maioris circuli A. C. volo inuestigare dimetientem circuli, qui aream capiat arbilonis ABCD, producatur linea

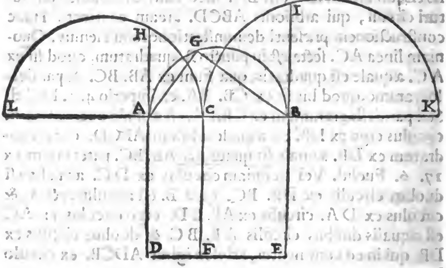
ex mutuo circulorum contactu B. donec rotundationis maioris circuli aream tetigerit BD. dico eam esse diametrum futuri circuli, qui arbilonis ABCD. aream continet. Hanc constructionem præsenti demonstratione suffulciemus. Quoniam linea AC. secta est in puncto B. quadratum, quod fit ex A C. æquale est quadratis, quæ fiunt ex AB. BC. & paralellogrammo, quod bis fit ex CB. BA. ex imperio 4. 2. Euclid. Sed paralellogrammum ex CB.BA. est æquale quadrato DB. circulus ergo ex DB. est æquale arbiloni ABCD. quod quadratum ex DB. æquale sit quadratis AB. BC. patet etiam ex 17. 6. Euclid. Vel quoniam circulus ex D C. æqualis est duobus circulis ex DB. BC. quia B. est angulus rectus, & circulus ex D A. circulis ex AB. B D. ergo circulus ex AC est æqualis duobus circulis A B. B C. & duobus circulis ex DB. qui in eo continentur, arbilon igitur ADCB. ex circulo D B. constat.

Corollarium.

EX hoc prouenit dato arbilone posse illico dari circulum ei æquale, scilicet lineam erigendo ad duorum semicirculorum coniunctione ad circumferentiam.

Si diameter secetur vtcunque, circuli, qui fiunt ex tota, & singulis partibus continentur, æquales sunt ei, qui à tota fit circulo.
Probl. 8.

FIat quadratum ex linea AB. & extendatur AB vsque ad K. & sit æqualis AB. & supra CK fiat circulus C I K. & ex alia parte BA extendatur in L, & sit æqualis AB. & super

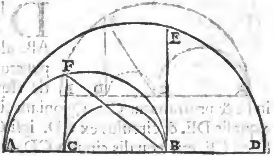


per CL. formetur circulus, & ſit CHL. & ſupra AB fiat alter circulus AGB. & ex C extendatur parallellus ipſi AD. BE. & ſit FCG. extendaturq. DA ad H. & EB ad I. ducanturq. ex G. GA. GB. Quoniam quadrangulum ex KB. BC. eſt æquale quadrato BI. & quadrangulum ex LA. AC. eſt æquale quadrato AH. coheant ipſæ BI. AH. in circumferentia AGB. in puncto G. quia in circumferentia ad rectum angulum: ergo quadratum ex AB. duobus quadratis AG. GB. æquale erit, & ſic de circulis, vel aliter.

Quoniam per præcedentem diameter diuiſa bifariam in C. quadratum ex AC. & CB. & rectangulum bis contentum ex BC. C ex BA. AC. eſt æquale quadrato AB. ſed rectangulum bis contentum ex BA. AC. eſt æquale quadrato ex CG. ſed quadratum ex BC. CG. & quadratum ex AC. CG. ſunt æqualia quadratis ex AG. GB. & quadratam ex AG. GB. ſunt æqualia quadrato ex AB. ergo oſtendimus, quod intendebamus, & eſt ſecunda ſecundi Euclid.

Si diameter ſecetur vtcunq; circulus ex tota,& eius parte contentus æqualis erit circulo, qui ex partibus continetur, & eius quod ex prædicta parte fit circulus. Propoſ. 9.

Sit diameter AB. ſecta vtcunq; in puncto C. dico circulum ex AB. BC. contentum æqualem eſſe circulo ex B C. C A. contento, & circulo C B.



Extendatur AB. in D. & ſit BD. æqualis ipſi BC. & ſuper ACBD. fiat circulus, & ſit A E D. & ex puncto B. eleuetur perpendicularis vſque ad E. Idem fiat ex altera parte. Supra A C. & C B. duo circuli, & aſcendat ex C perpendicularis C F vſque ad ſemicirculum AFG, extendaturq. FB.

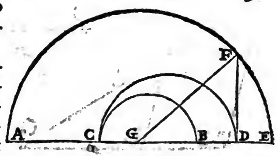
Quoniam quadrangulum, quod fit ex AB. BD. æquale eſt quadrato, quod fit ex BE. & quadrangulum, quod fit ex BA. AC. æquale quadrato ex CF. ſed quadratum ex FB. æquale eſt quadratis FC, CB. quia C. angulus eſt rectus ergo circulus ex AB. BC. quod eſt BF æquale eſt circulis ex CB. & qui fit ex BC. CA. & eſt 3. 2. Euclid.

Si diameter secta fuerit in partes æquales,& inæquales circulus ex inæqualibus partibus contentus vna cum eo,qui fit ex linea, quæ inter sectiones interijcitur æqualis est circulo, qui fit à dimidia. Prop. 10.

DEscribatur circulus ex Diametro CA. alter ex AB. alter vero ex CD. ex D. puncto erigatur perpendicularis vsque ad circumferentiam in E. & protrahatur CE. Quoniam circulus ex AD. DB. est æqualis DE. & circulus ex CD. ipsi CD. ergo circulus, qui fit ex CE. erit æqualis circulis CD. DE. sed CE. est æqualis CA. quia ex centro ad circumferentiam, ergo circulus ex duabus inæqualibus partibus compositus AD. DB. qui est DE. & circulus CD. vtrique æqualis est circulus ex dimidia CA. compositus, & est 5. 2. Euclid.

Si diameter bifariam secetur,eiq. in rectum adijciatur quædam recta linea, circulus ex tota diametro cum adiecta tanquam ex vno diametro,vna cum circulo dimidiæ æquales sunt circulo ex dimidia, & adiecta tanquam ex vna diametro descripto. Prop. 11.

SIt diameter AB. secetur bifariam in C. & ei in longum adijciatur linea BD. dico circulus descriptus ex AD. DB. vna

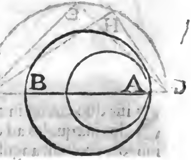


DB. vna cum circulo CB. æquales esse circulo, qui fit ex CD.

Lineæ AD. adijciatur DE, quæ sit æqualis DB, & centro G interuallo GE describatur circulus AFE. & ex puncto D linea ad rectum erigatur vsque donec circuli circumferentiam contingat, & sit DF. & erit quadratum quadranguli AD. DE. & puncto D, linea DC secetur CB æqualis, & erit GD. & connectantur puncta GF. linea GD est æqualis CB. ex constructione. Quoniam linea AC. est æqualis lineæ CB. & CB ipsi GD. adijciatur ipsi AC. communis CG. & linea DE. est æqualis BD. ex constructione, ergo CD. ipsi GE. & angulus ad D. rectus est, valet ergo quadratum GF. quadrata GD. DF. ergo quadratum GF. valet quadratum CD. quod demonstrandum proposueramus, & est 6. 2. Euclid.

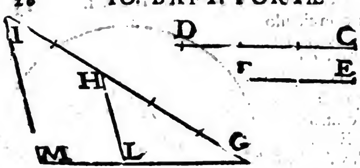
A dato circulo alium in datam proportionem abscindere.

Prop. 12.



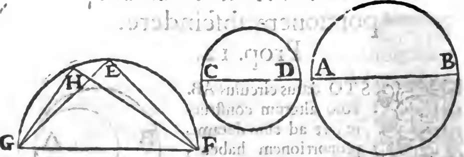
ESTO datus circulus AB. volo alterum construere, vt ad eum datam proportionem habeat, sitq. data proportio CD. ad EF. scilicet sesquialtera. Iungantur angulo binæ lineæ, quarum vna GH. sit æqualis lineæ CD. protendanturq. quousque HI sit æqualis EF. Mox alteri lineæ æquetur dia-

D meter

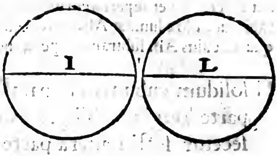


meter AB. quæ ſit GL. iungaturq. HL. & GL. extendatur, & à puncto I. lineæ H L. paralellus excitetur I M. dico LM. diametrum eſſe quęſiti circuli A O. ſubſequialteri, & erit quarta linea proportionalis inuenta. Quoniam proportio GH. ad HI. eſt ſicut GL. ad LM. ex 12.6. Eucl. & GH. ad HI. eſt ſeſquialtera, ergo GL. diameter ad AO. diametrum ſeſquialtera eſt.

Ex duobus inæqualibus circulis duos æquales facere. Prop. 13.

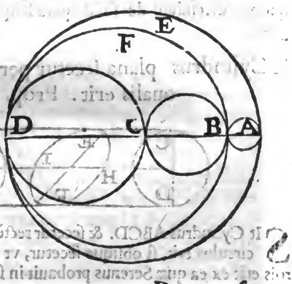


Sint duo circuli inæquales AB. CD. volo hos duos circulos inæquales ad duos æquales reducere AB. DC. coniungo ad rectum angulum diametros, & ſint GHF. & connecto GF. tunc ſuper FG. facio ſemicirculum, qui per H rectum angulum trãſibit, mox diuido circumferentiã in E. bifariam, & pro-



produc o GE.EF. dico duos circulos duarum dimetientium GE, EF. esse æquales duobus dimetientibus GH, HF. & proinde circulis I, L. Quoniam angulus H est rectus, quia ad circumferentiam, ergo quadrata GH. HF. sunt æqualia quadrato GF. & quadratis GE, EF. etiam æqualia quadrato GF. & quæ æqualia vni tertio æqualia inter se, ergo circuli I, L. sunt æquales AB. CD.

Circulum formare, qui capiat arbilonem trium minorum circulorum, ab imo maiori contentorum, qui tres circuli æquales sint diametro continentis. Prop. 14.

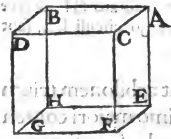


ESTO circulus AED. cuius dimetiens AD. tribus circuli diametris intercidatur DC CB, BA. postulamus circulum formare, qui arbilonem, vel interceptam aream à maioris circuli cōcauitate, & minorum conuexitate contineat. Ex BD Diametro circulus

D a fiat

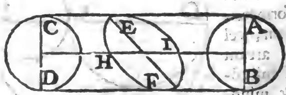
fiat BFD. & per superiorem propoſitionem 7. arbilon BFDC capiatur, mox lunulæ AEDFBC quantitas cognoſcatur, à qua circulus AB. ſubtrahatur per 4. noſtram, & ſic de cæteris.

Si ſolidum cubum, vel parallelipedum altera parte longius oblique ex oppoſitis lateribus ſecetur ſectio altera parte longius erit. Propoſ. 15.



Eſto ſolidus cubus ABCDEFGH & ſecetur à plano BDEF. oblique ex oppoſitis cubi lateribus BD. EF. dico BDEF. eſſe altera parte longius. Quia DG, GF, æqualis eſt. DF autem ſubiacens linea eſt æqualis duobus quadratis DG. GF. ergo longior BD. quæ ipſi DG æqualis eſt, idem dicendum de altera parte BH. HE. quia BE, maior eſt BH. HE. Igitur BDEF. altera parte longior eſt. Idem quoque dicendum de ſolido parallelipedo altera parte longiori.

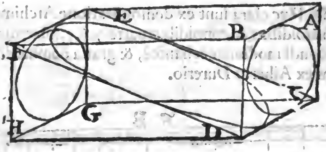
Si Cylindrus plana ſecetur per obliquum ſectio oualis erit. Prop. 16.



Sit Cylindrus ABCD. & ſecetur rectè ABG. ſectio AGB. circulus erit, ſi oblique ſecetur, vt in IEHF. ſectio ſphæroïs erit ex ea quæ Serenus probauit in ſuis Cylindricis.

Si

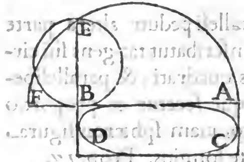
Si intra ſolidum paralleli pedum altera parte longius cylindrus inſcribatut tangens ſui circuli baſis latera eius quadrati, & parallelipedum ſolidum obliquè ſecetur ea proportio erit circuli quadrato, quam ſphærois figura ad ſuum altera parte longius. Prop. 17.



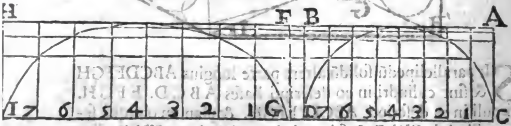
SIt parallelipedũ ſolidũ altera parte longius ABCDEFGH & ſint cylindri in eo deſcripti baſes A B C D. E F G H. circuli in ea deſcripti ABCD. EFGH. & planum obliquè ſecans illud ſit CDEF. & ſphærois in eo deſcripta CDEF. dico ſphæroidem intra ſe deſcriptam eandem habere proportionem ad ſuam figuram altera parte longiorem, quàm circulus ABCD. ad ſuum quadratum ABCD. cuius demonſtrationem omittimus: nam ex his, quæ Euclides in ſuorum elementorum, 12. & Archimedes in 31. præpoſitione deſcripſerunt, demonſtratur.

Data ſphæroide circulum eiuſdem areæ deſcribere. Prop. 18.

ESto data ſphærois ABCD. iubeoq circulum eiuſdem ſpatij. Circa datam ſphæroidem quadrangulũ circumſcribatur



batur ABCD. & latus AD prolongetur, vsque ad F. vt BF. sit æqualis BD. Et circa AF. semicirculus describatur, elongeturq. BD. donec circumferentiam feriat, & sit in puncto E. dico circulum conscriptum circa BE. diametrum continere aream sphæroidis ABCD. Hæc clara sunt ex demonstratione Archimedis libro de sphæroidibus, & conoidibus parte 5.6.7. sphæroidem idem describendi modum mechanicè, & gratia commoditatis proponam ex Alberto Durerio.

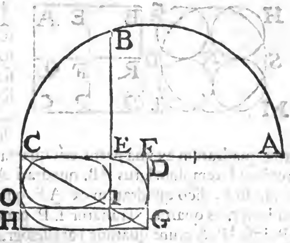


Describe quadrangulum in duplo triplo, aut sesquialtero, & sit in circulo supra AB. infernè CD. cuius latus CD. diuide in puncto E. per medium, ac posito vno circini pede in puncto E. interuallo EC. ducatur per superiorem partem vsque ad D. continget hic arcus lineam AB. deinde partire lineam CD. in octo æquales partes, & ex singulis diuisionibus protrahe sursum parallelas in nuper descriptum arcum. Deinde fac iuxta quadrangulum ABCD. adhuc alium quadrangulum æqualis altitudinis, sed longitudinis quantæ volueris cuius superior linea FH. inferna vero GI. & seca id quoque in octo partes æquales, vt prius; postea producito ex singulis sectionibus sursum lineas parallelas, deinde ex singulis inter

sectio-

ſectionibus prioris: arcus,quæ per octo lineas parallelas factæ ſunt, parallelas tranſuerſales per omnes perpendiculares longioris quadranguli,& per ſectiones illas longiorem parallelorum arcum produc lineam arcualem de puncto in punctum incipiendo ab angulo G. & finiendo in I, vt vides.

Datam ſphæroidem duplare, vel quadruplare. Probl. *19*.

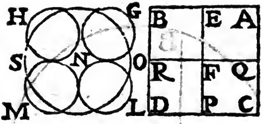


SIt duplandum quadrangulū ECIO.quod idem eſt,ac duplanda ſphærois, quod intra illud circum ſcripta eſt,& quadrangulum: erit ſimile, ſimiliterq. poſitū, quemadmodum, & ſphærois. Producatur latus quadranguli EC.vſque ad A.& ſit AE. dupla ipſius AC. ac ipſius AC. medio D. poſito circini pede, D A interuallo, deſcribatur circulus A B C. producaturq. I E. vſque ad circumferentiam B. & erit E B latus vnum rectanguli deſcribendi. Reſcindatur igitur ex C A, linea C F, æquali E B, & ducatur diameter CI. deinde per F. ducatur parallela ipſi EI. quouſque occurrat diametro CI in G. & per G altera parallela ipſi FC producatur, quæ ſit GH compleaturq. parallelogrammum FH. erit igitur hoc parallelogrammum ipſi CI. ſimile, ſimiliterq. poſitum duplum. Quoniam AE. FE. EC. ſunt tres lineæ proportionales ex 13.6. Euclid. erit vt AE. prima ad EC. tertiam, ita parallelogrammum FH. ex EF. ſecunda

cunda

cunda (nam CF sumpta est æqualis EB.) ad parallelogrammum E O. supra tertiam E C. quod simile, similiterq. descriptum.

Si circuli diameter bifariam secetur, & ex vna parte circulus fiat hic erit totius pars quarta. Prop. 20.

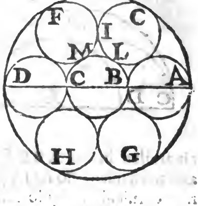


Rationes circulorum sequuntur rationes quadratorum eis circumscriptorum, vel inscriptorum, & quemadmodum, si quadrati diameter diuidatur quadratum ex vna parte, erit quarta parte totius, ita, & circulus; Exemplum latus AB. quadrati A D. diuidatur bifariam in E. dico quadratum ex A E. quod est AF. est AD quadrati pars quarta. Trahatur E P parallela, ipsi AC. & Q R. ipsi AB, & erunt quatuor parallelogramma rectangula, & si aliter probari posset rationem recitabo apud Platonem in Memnone. Socrates enim puerum hoc modo docet. Sit bipedalis linea AB. dico suum quadratum esse quatuor pedum AQ erit vnius pedis, erunt dico quadrata QF. FR. sit & altera pars CD duos pedes longa vnum alta C. erunt enim duo quadrata CF, FD. tota igitur quatuor erit pedum. Sit ergo circulus OILM. cuius diameter O N S. diuidatur bifariam in N. ex quantitate ON. quatuor circuli inscribantur, dico quatuor hos circulos toti æquales esse. Ratio ex superiori pendet: nam & circuli se habent ad quadrata, vt eorum diametri.

Cir-

Circulorum vacua metiri, quando maior minores contineat. Prop. 21.

SIT magnus circulus AEFDHG, cuius diameter AD, diuidatur in tres partes, & in eo fiāt tres circuli AB, BC, CD, & supra duo alij, & duo infra inscribantur; nam sex circuli æquales intra vnum inscribuntur ex 15. 4. Euclid. & ex præcedenti totus circulus nouem circulos cōtinebit: nam diameter trifariam



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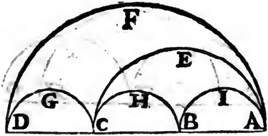
diuisa est, sunt intus septem contenti, ergo omnia vacua duo erunt circuli cuius 3. pars erit scalprum EIF. cum suo residuo ILM.

Arbilones per circulares figuras metiri. Prop. 22.

SIt arbilon primū AFDGCHBIA. inuestigādum quot circulos capiet, qualis AB. Ex præcedēti semicirculus AFD nouem capiet semicirculos qualis AIB



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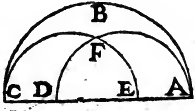
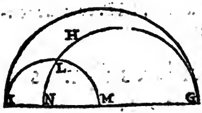
si substuleris AIB, B H C, C G D, erit arbilon reliquum sex

E semi-

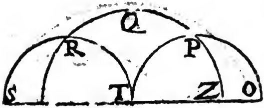
ſemicirculorum. Si quærimus arbilonem AFCHBI. erit ſemicirculus AEC quatuor ſemicirculorum qualis AIB, demptis duobus AIB, BHC, erit arbilon duorum ſemicirculorum. Si quærimus arbilonem AFDGCEA, erit ex iam dictis quatuor ſemicirculorum.



At ſi ſemicirculus maior ABC capiens duos ſemicirculos AED, EFC, vt docuimus in prima noſtri, dico arbilonem ABCFA eſſe æqualem duplato EFD, quod ex figura patet: nam quod replicatur in figura EFD deficit arbilon in ſua A B C F. Vel quarta pars dupli BEA. eſt æqualis ſemicirculo AFD. pars extera EFD eſt æqualis interiori corniculari angulo FBA.

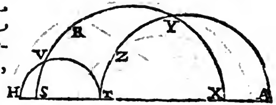


Idem eueniet in figura GHI: nam duo ſemicirculi GHLN, & MLI. per ſecundam noſtri capiũt aream continentis circuli G H I. Vnde duplatum MLN. eſt æquale arbiloni GHLIHG.



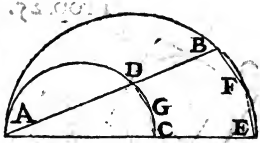
Poteſt etiam euenire, vt arbilon medium PQRT eſt æquale duobus extrinſecis circuli partibus O P Z R S. ex ſuperiori ratione.

Idem eueniet in hac postrema, vt arbilon YZTVRY. sit æquale duobus circuli extrinsecis partibus A Y X, S V H.



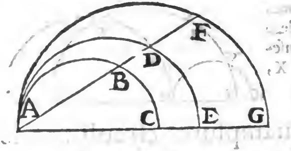
Si duo vel quamplures circuli in fine diametri se tangunt à contactus autem puncto ducatur linea eos secans arcus secti inter se similes erunt. Prop. 23.

Sint duo circuli ABE, ADC se mutuo tangentes in fine diametri A, & ducatur recta linea ADB, secans arcus ADC, in D, & ABE, in B, qui quidem arcus bifariam secentur, quia anguli in circulo oppositi per 22. 3. duo æquales rectis duobus in 2. ergo angulus BGC, & BFE æquales sunt cum eodem BAC angulo iuncto.



Data circuli portione eam multiplicare, Prop. 24.

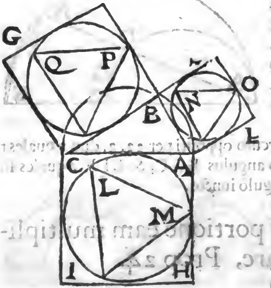
Sit data circuli portio AB, quam volo duplare & sit eius circulus ABC, & sit semicirculus ADE du-



plus dati. Per primam nostri, linea A B trahatur longius in D, & si voluerimus quadruplare sit circulus A F G quadruplus & linea A D in F extẽdatur, dico portionem DA ipsius BA duplam, & FA ipsius BA quadruplam cuius ratio pendet ex anteriori.

Ex duabus portionibus similibus vnã similem facere, vel subtrahere.

Prop. 25.



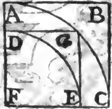
SInt duę inæquales circuli portiones PQ. ON. sed similes, & sit vnaquęque tertia circuli pars per 25. 3. Eucli. & sint PQG, ODN; circa quos describantur quadrata BG, EB, vel eorum diametri, & iungantur ad rectum angulum ABC, & secundum AC describatur quadratum, & in eo circulus MLI, & sit ML latus æquilateri trianguli. Portio ML erit æqualis iam dictis dua-

duabus portionibus per ea quæ in 3. Euclid. probantur. Vel si ex ML voluerimus portionem PQ subtrahere, è recto quadrato AC, ac supra AC semicirculo descripto, ponatur latus quadrati BC, & eius latus BA latus quadrati portionem similem continentis. Et sic possumus ex pluribus portionibus vnam facere, & omnia illa, quæ de integro circulo retulimus.

Datum semicuruilineum triangulum duplare, subducere, vel è duobus similibus vnum facere.

Prop. 26.

Sit semicuruilineum triangulum DGE, quod volo duplare, & sit circuli quarta pars FDE, fiat etiam circuli dupli pars, & sit AGC, circa eam quartam etiam quadrati partem circumscribo ABCF, dico triangulum semicuruilineum ABCG. duplum esse DGE, Quia quadratum ABCF duplum est DGFE inscripta portio proportionalis erit. Et sic subtrahere, & ex multis vnam facere poterimus ex supradictis.



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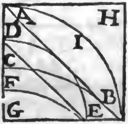
Eodem modo triangulum DEG duplare poterimus, quod est æquale iam dicto: nam quadrati dimidium BHA est æquale BAG, si dematur portio BIA, æqualis BCG. remanet triangulum BAG. æquale BHA, iam dicto.



.O I

dicto. Vnde si voluerimus prædictum EDF semicurvilineum triangulum duplare, duplato quadrante HABG, protractoq. diametro BA. circulus duplus BIA, qui erit BC describatur BC, & erit triangulum ABC duplum trianguli EDF.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM Liber Secundus.

AXIOMATA.

I.

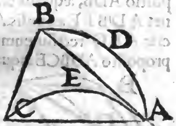
SI eidem addideris, quod prius dempseris, quantitas æqualis erit.

II.

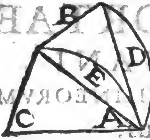
Si nota quantitas à nota subtrahatur, quæ remanet nota erit.

Triangulum semicuruilineum ex æqualibus, iisdemq. circumferentijs compositum quadrare. Prop. I.

ESto triangulum quodpiam semicuruilineum A D B C E, Aequalibus nimirum iisdemq. circumferentijs ADB, AEC, & recta B C basi constituta volo illud quadrare. Ducatur linea AB, & AC, aio aream trianguli semicuruilinei



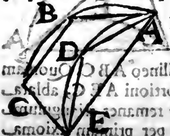
ADBCE esse æqualem triangulo rectilineo A B C. Quoniam circumferentia A D B est æqualis portioni A E C, ablata A D B, repositaq. in A E C æquale remanet triangulum rectilineum A B C semicuruilineo per primum axioma nostrum.



Vel fiat triangulum æquale rectilineum ABC, & sit AFC ex 22.1. Euclid. erit semicuruilineum triangulum ADBCE, æquale triangulo semicuruilineo AECF, dempta communi portione AEC remanet rectilineum ABC triangulo semicuruilineo æquale ADBCE.

Alter Casus.

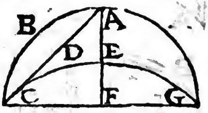
AT si triangulum ADBCE angustius erit, & portionis lineæ neutiquam intactas circumferentias delinquent, sed per medium transibunt, eadem operatione idem assequi poterimus. Sed quo res dilucidior euadat, rem exemplo complectemur. Ergo triangulum ADBCE, & circumferentia ADB æqualis sit AFC, trahanturq. rectæ lineæ AB, AC, & secet AB basis ADB circumferentiam AEC, aio rectilineum ABC æqualem semicuruilineo ADBCE. Quoniam portio ADB, æqualis est AEC dempta communi AEF, remanet ADBFE æqualis AFC, apponatur vtrique areola FBC, erit ABC rectilineum triangulum semicuruilineo triangulo proposito ADBCE æquale.



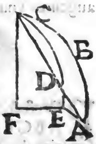
Vel ad eadem præstanda possumus easdem circumferentias in plures partes diuidere, nempe binas, ternas, quaternas, vt ABC circumferentiam in AB, BC, & ADE in AD, DE. Vnde exclusæ partes AB, BC, inclusis AD, DE erit area rectilinea ABCEDA æqualis semicuruilineo ABCEDA.

Trian-

Triangulum ſemicuruilineum ex varijs circumferentijs compoſitum quarum altera alterius dupla ſit quadrare. Prop. 2.



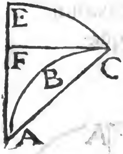
ESto triangulum ſemicuruilineum ABCDE cuius circumferentia EDC ſit circuli dupli ipſius ABC. Sed EDC ſit octaua pars circumferentiæ ſui circuli GEDC, circuli vero ABC quarta. Aio triangulum ſemicuruilineum ABCDE rectilineo inueſtigari poſſe parem. Rem ita moliemur. Completa circumferentia CE, ſit CEG, & coniungatur AC, mox portionem CEG diuidatur per medium, & ſit diuiſionis linea EF, dico triangulum AFC ſemicuruilineo triangulo parem eſſe. Quoniam tota portio ABC æqualis eſt dimidiæ ECF, id propterea dempta ABC portione repoſita EFC ſemicuruilineum ABCE, abijt in triangulum rectilineum ACF.



At ſi circulares lineæ magis cohærebunt, vt circumferentiarum baſes introrſum ſe ſecent, eadem erit operatio, & demonſtratio, vt in prima propoſitione. Productis lineis portionis AC, & ſemiportionis EFC triangulum rectilineum AEFC ſemicuruilineo par erit. Quoniam ſpatia ipſarum portionum ABC, EFC æqualia ſunt, ablata interiacente portione DC, quod reliquum eſt ABCD ipſi EDCF æquale erit, addita vtrique areola AED, erit totum triangulum rectilineum AEFC toti ſemicuruilineo ABCDE æquale, nam quanta pars ex

F dem-

demptione abijt, tota ex repositione substituta est.



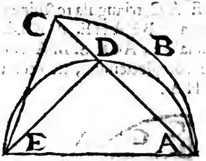
Vel potest transpositis lineis alio modo triangulum semicuruilineum constitui sit circumferentia dupli CDE retro CBA ante, tunc ex puncto C. super basim AE cadat perpendicularis CF, & connectatur CA, & sic triangulum semicuruilineum ABCDE rectilineo FCA parem iri. Ratio in superiori.

At si vt diximus ex varijs, & inæqualibus circumferentijs orbiculata triangula composita erunt, tunc mente concipiendum, si circulus duplus alteri sit, subdupli duæ circumferentiæ partes, vni dupli respondent, si quadrupli quatuor, & sic deinceps. Esto verbi gratia circuli dupli circumferentia EDC, & sit octaua suæ circumferentiæ pars respondet duobus octauis subdupli circuli ABC. Diuidatur ambiens linea ABC bifariam in B, & trahatur AB, BC, EC, & erunt duæ AB, BC portiones, vni EC æquales, & sic vna EDC, duas illas AB, BC absumet. Vnde si triangulum semicuruilineum duabus octauis circumferentiæ partibus decrescimus, AB, BC augemus vna EDC, & sic par pari referemus.

Alter Casus.

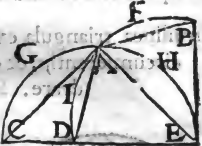
POtest & aliter euenire; sit triangulum semicuruilineum ABCED, & sit ABC quarta dupli circuli, & ADE semicirculus subdupli, docebimus quomodo possis rectilineũ triangulum æquale semicuruilineo facere. Trahantur ex puncto per medium circuli ADE vsque ad C, & sit linea ADC, & linea DE. Erit triangulum semicuruilineum ABCED

æquale



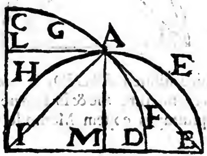
ęquale rectilineo DCE. Quoniam portio A B C est dupla ipsius AD per 19. primi nostri, & huic nempe portioni AD æqualis DE. dematur dimidia portio ABCD, addatur DE compar, remaneatq. communis areola DCEF, vtrique sic enim rectilineum triangulum DCE æquale semicuruilineo ABCED, & sic excessus vnius alterius defectu rependetur. Sic & in alijs notis circumferentijs quadruplis quintuplis eodem Methodo vti poteris.

Semicuruilinea triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs, vel ex æqualibus nota quadrare. Prop. 3.



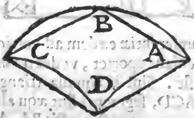
SI duo semicirculosa triangula ad verticem constituta ex eisdem, & æqualibus circumferentijs fuerint ductis à vertice ad bases rectis lineis, erunt rectangula circulosis ęqualia. Si primam huius libri leges non secus esse inuenies, quã diximus. Si acciderit, vt circumferentiæ eædem ad verticem sint inæquales, sed in id conueniant oportet, vt dextra interior sinistræ exteriori æqualis sit. Sint inæqualia triangula se inuicem decussantia BAE, ACD, segmenta sint æqualia vt BEA, AID, & EHA, AGC, tunc protractis rectis BA, AD,

AE, AC, triangula rectilinea BAE, ADC, erunt circulosis æqualia BFAHE, AGCDIA. Quoniam segmentum BFA æquale est AID. Si BFA seorsum expellimus, & AID sua vice complectemur, sic etiam reijcimus AGC reponimus EHA.



At si fuerint duo semicuruilinea triangula BEAFD, & AGCIH constituta ad verticem A ex inæqualibus circũferentijs notis quarum DAC sit circulus duplus ipsius BAI. Trahantur duæ lineæ perpendiculares ex A ad CI. & sit AL, & AM ad BI. & binæ aliæ rectæ BA, AI, dico rectilinea triangula ALI, ABM, simul iuncta æqualia esse. Semicuruilineis BEAFD, CGAHI. Quoniam periferia DAC est circuli dupli quarta, & BAI subduplus semicirculus, duæ semiportiones AFDM, AGCL, absument duas portiones BEA, AHI. demptis igitur BEA, AGCL, repositisq. AHI. AEBM, rectilinea triangula BAM, LAI, æquiualebunt semicuruilineis iam dictis.

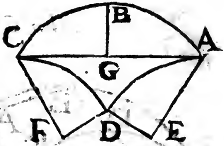
Curuilinea triangula ex eisdem & æqualibus circumferentijs, & ex varijs notis quadrare. Prop. 4.



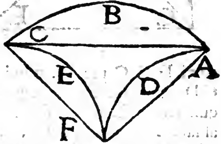
Esto curuilineum triãgulum ex tribus circumferentijs ABC, CD, DA, eiusdem curuis, sed ABC, dupla AD, DC constitutum quod quadrare intendimus. Dico protractis

ctis æqualibus ſubtenſis AB, BC, CD, DA quadrilaterum, rectilineum ABCD, eſſe æquale curuilineo ABCD. Quoniam demendo portiones AB, BC, addendoq. AD, DC, quæ ſimul æqualia ſunt voti compos fies, vel aliud dicimus.

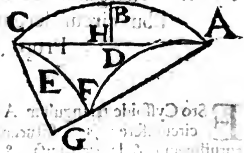
Poterimus alio modo id aſſequi. Protrahatur linea AC, & binas AE, ED, & lineas CF, FD, vt ſemiportio AED ſit æqualis A B G, & DCF, & ipſi BGC, nam duæ portiones dimidiatæ ADE, CDF æquiualent vni integræ A B C. Vna hac dempta, his additis quod diximus eueniet.



Eodem modo curuilinea triangula ex inæqualibus circumferentijs, ſed altera alterius exempli cauſa ſit dupla. Sit curuilineum triangulum A B C E F D ex inæqualibus circumferentijs, ſed A B C dupla ſit ADF, & F E C ſubtenſis lineis A C, A F, F C erit quadratum nempe binæ portiones ADF, EFC æquipollent ſimplici A B C, vnde illa dempta, his additis triangulum rectilineum FAC æquipollet curuilineo propoſito.

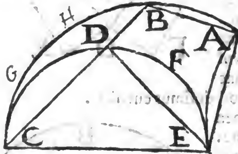


Poteſt contingere, vt triangulum conſtituatur ex varijs circumferentijs, & inæqualibus, vt F E C ſit dimidia ipſius A B C, & ipſa ABC, dupla ipſius A D F, ſic facta ſemipor-tio-



tione CFG, æquali BHC, & subtensis A F portio A D F erit æqualis ABH. Vnde hac dempta, illis subditis triangulum rectilineum ACG erit æquale curuilineo ABCEFD.

Alter Casus.



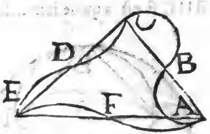
ESto curuilineũ triangulum ABCDFE propositum quadrãdum, & circumferentia circuli A B C sit dupla E F D G C, diuidatur circumferentia E D C bifariam in D, & trahatur C D B erit ceratoide triãgulum B H C G D æquale portioni D G C per 19. primi nostri. Vnde dempto B H G C D reponatur eius vice portio E F D æqualis D G C, & quia circumferentia A E est æqualis, & eadem ipsius A B, ablato A B reposita A E, trapezuim rectilineum A B D E erit æquale proposito curuilineo triangulo A B H C G D E F.

Cyssoide triangulum ex æqualibus, & inæqualibus circumferentijs quadrare.

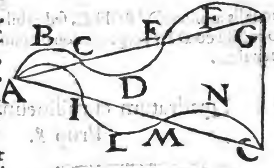
Prop. 5.

ESto Cyssoide triangulum A F C ex tribus inæqualibus circumferentijs constitutum A B C, C D E, E F A curuilineum, & latera diuisa, & æqualibus circumferentijs con-

constituta, vt A B, sit æqualis B C, & C D, ipsi D E, & E F ipsi F A, vnde tractis lineis rectis AC, CE, E A, & demptis tribus circumferentijs BC, DE, FA, & alijs tribus repositis A B, C D, E F, rectilineum triangulum A C E æquale est cyssoidi ABCDEF.



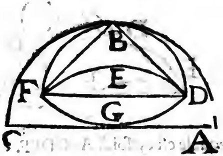
Sit quoque semicyssoide triangulum quadrandum A B C D E F G I L M N O, ex varijs circulorum circumferentijs, sed tamen binis semper oppositis æqualibus constitutum videlicet G F E maioris circuli circumferentia, quam E D C, & E D C maior C B A, sed tamen G F E æqualis O N M, & E D C, I L M, & C B A, A H I, si à puncto A ad basim G O lineæ rectæ trahantur, totum assequeris, ratio pendet ex superiori.



Arbilonem quadrare. Prop. 6.

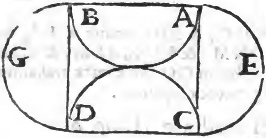
Esto arbilon A H E C D B quadrandum, quia portio A H est dupla AB, & A B est æqualis semiportionis B G D, ergo ablata A B, H, & reposita

posita BGD, & ablata HCE reposita DCF, rectilineum GBHCF est æquale iam dicto arbilioni.



Potest & alio modo probari. semicirculus ABC est duplus semicirculi DBF, ergo vacuum ABDGFBC. est æquale semicirculo, dematur ex vtroq; portio DEF, DGF, ergo lunula DBFE est æqualis arbiloni DABGFBC, sed arbilon est æquale triangulo rectilineo DEF, ergo arbilon dictum triangulo DBF, est æquale.

Quadratum curuilineum quadrare. Prop. 8.



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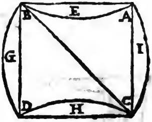
Esto quadratum curuilineum AFBGDFCE. trahantur quatuor lineæ ex angulis AB, BD, DC, CA, dico quadratum rectilineum ABCD curuilineo iam dicto præstabit. Quoniam sunt quatuor semicirculi æquales inuicem, tollantur AEC, BGD, reponantur AFB, CFD, sic rectilineum curuilineo æquale erit.

Alter Casus.

Potest & quadratum aliter fieri, ex quatuor etiam rectis angulis, vt diximus ABC. Quoniam portiones æqua-

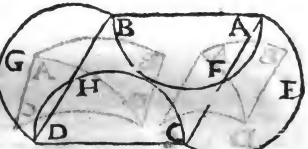


æquales sunt, & ex æqualibus circulis, ablatis portionibus A I C, B G D, repositisq. A E B, C H D rectilineum quadratum ABDC, curuilineo A E B G D H C I A æquipollebit.

Corollarium.

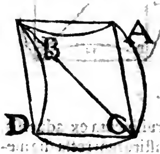
HInc patere potest quadratum curuilineum ex aduersis, & conuersis circumferentijs constitutum recta diameter bifariam secat, latus A B, lateri A C æquale est, & basis B C communis vtrique, ergo triangulum C A B triangulo B D C æquale erit: igitur bifariam secat, & vtrumq. ex conuexo, & concauo æquali latere constat.

Rhombum curuilineum quadrare, Prop. 8.



ET Rhombus curuilineus A F B G D H C E quadrabitur, ductis ex angulis rectis lineis AB, BD, DC, CA, nam demptis semicirculis A E C, D B G, repositisq. AFB, C H D, demptisq. portionibus HDAF, rectilineum Rhombum curuilineo æquabitur.

Alter Casus.

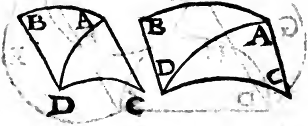


Poteſt eſſe Rhombus alio modo ex æqualibus circumferentijs AB, BD, DC, CA, & quoniam portiones æquales ſunt, duabus demptis AC, CD, totidem repoſitis AB, BD erit rectilineo æqualis.

Corollarium.

Eiuſmodi etiam Rhombos recta dimetiens æqualiter ſecabit; nam hinc inde duo æqualia triangula conſtituent.

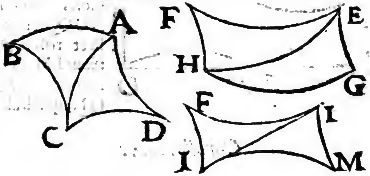
Rhombos, ſeu Rhomboides ſemicuruilineos quadrare. Prop. 9.



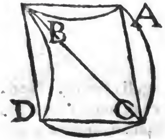
Semicuruilineus Rhombus, & Rhomboides facilius quadrabitur: nam portione vna dempta, altera repoſita, æquales erunt curuilinei rectilineis.

Corollarium.

SEd in iſtis, qui ex iſoſcelibus triangulis ſemicuruilineis conſtituuntur curua diameter circumferentiæ æqualis, & eos bifariam ſecabit; nam in duo æqualia iſoſcelia triangula diuiduntur ſemicuruilinea, vt ABD, ADC.

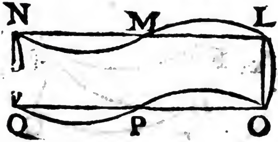


Poſſunt & alio modo Rhombos, & Rhomboides in Iſoſcelibus triangulis conſtitutos ex tribus conuerſis, & vna auerſa diametro per mediam diuidere, vt in Rhombo A B C D. Rhomboide E F G H, cum diameter A C, E H eos bifariam diuidat in duo Iſoſcelia æqualia A B C, A C D, & E H G, E H F, & in Rhomboide ex quatuor conuerſis conſtituto diameter recta etiam I L in duo ſemitriangula æqualia diuidit ex oppoſitis angulis ducta.



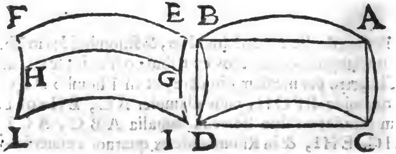
Altera parte curuilinea, & ſemicuruilinea quadrare. Prop. 10.

ALtera parte longiora quadrabis omnia, vt quadrata, duobus ſemper portionibus oppoſitis ablatis, & repoſitis, vt in ABCD.



Erit altera ſpecies altera parte longioris curuilinei LNOQ demptis ſcilicet tribus portionibus LM, PQ, OL, repoſitis MN, OP, QN, quadrabitur.

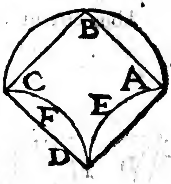
Corollarium.

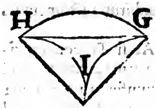


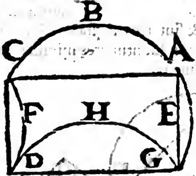
AT reliquas ſpecies diuides non dimetiente ex angulo ad angulum ducta, ſed per medium vtrinq. latera parallela, vt in EFIL dimetiens GH.

Peleces quadrare. Prop. 11.

POssunt peleces multifariam variare ex varijs circulorum circumferentijs, & primo ex partibus, cuius partes circumferentiæ dimidij circuli A B C, aliæ duæ partes ex duabus quartis eiusdem circuli A E D, D F C, vt demptis illis, his repositis, rectilineum quadratum peleci æquale erit.



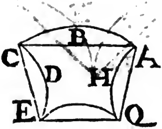




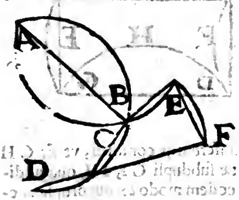
Potest & ex duplicis circumferentijs constitui, vt sit G H quarta dupli, duæ vero quartæ subdupli G I, I H, quæ additæ rependent ablatum G H, eodem modo ex quadrupla eueniet. Pelecis ex inæqualibus, sed eisdem circumferentijs, & varijs, vt Pelecis G E A B C F D H quadranda portio A B C sit æqualis G H D, & D F C, G E A, demantur A B C, reponantur G H D, D F C, & erit quadrilaterum rectilineum A C G D æquale supradictæ Peleci.

Trape-

Trapezia curuilinea ex æqualibus, & inæqualibus circumferentijs constituta quadrare. Prop. 12.



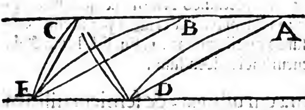
SInt Trapezia curuilinea ex quatuor, vel pluribus circumferentijs constituta, vel omnibus inæqualibus, vel tribus, aut duobus, dummodo inter eas ita conueniant, vt tres, duæ, aut plures possint, quantum vna, aut aliæ: nam sit portio A B C tripla, & sint tres æquales A H Q, Q F E, E D C, dematur maior, addantur tres minimæ, & coæquabitur rectilineum curuilineo.



At si Trapezium figuratum fuerit, vt ijsdẽ circumferentijs, & æqualibus constituatur, sed cũ alterũ altero longius sit, & quantum in altero deficit in altero superfit, minus addatur superfluo, & fiat æqua compensatio. A B duæ portiones demantur, addantur duobus alijs B C, C D, & quia pars E F superabit, deficit verò E B, huic addatur illius vice, sic rectilineum B E F D C B curuilineo æquabitur.

Trian-

Triangulum Isoscele curuilineum, & parallelogrammum semicuruilineum in eadem basi constituta, & eisdem parallelis, parallelogrammum triangulum duplum erit, & rectilineis æqualia erunt. Prop. 13.

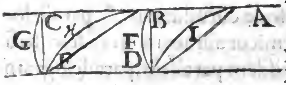


Sit triangulum Isoscele semicuruilineũ DCE, & parallelogrammum semicuruilineum ABDE in eisdem parallelis ACDE dico parallelogrammum in eadem basi, & eisdem circumferentijs constitutum esse triangulo duplum. Quoniam portio DC ipsi CE æqualis, dematur EC, addatur DC, erit triangulum rectilineum DCE curuilineo æquale. Et quia portio AD ipsi BE æqualis, dematur BE, addatur DA erit rectilineum parallelogrammum ABDE semicuruilineo æquale, sed rectilineum ABDE triangulo DCE duplum est; quia in eadem basi, & eisdem parallelis constituta per 41. 1. Eucl. ergo parallelogrammum rectilineum curuilineo triangulo duplum.

Parallelogramma semicuruilinea in eadem basi, & æquidistantibus circumferentijs constituta, & inter parallelas æqualia sunt. Prop. 14.

Sint duo parallelogramma BFDCGE, & AIDBHE in eadem basi DE, & in eisdem parallelis rectis AC,

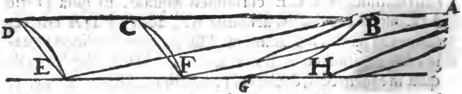
DE



D E constituta, dico inuicem esse æqualia: trahantur rectæ A D, B E, E C, quia portio BFD est æqualis CGE dematur CGE, reponatur B F D, rectangulum parallelogrammum curuilineo æquale. Idem dicendum de altero parallelogrammo AIDB-H E curuilineo æquale est rectilineo ADBF, & quia parallelogramma rectilinea in eadem basi, & eisdem parallellis constituta ad inuicem sunt æqualia per 36. 1. Euclid. Idem & de parallelogrammis curuilineis dicendum.

Parallelogramma curuilinea, & semicuruilinea cum æqualibus basibus,& eisdem circumferentijs,& eisdem parallelis constituta inuicem sunt æqualia.

Prop. 15.

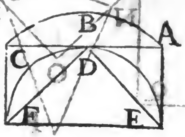


SInt duo parallelogramma semicuruilinea, & æquidistantibus circumferentijs AH, GB, & CF, DE, & æqualibus basibus constituta FE, GH, & in eisdem parallelis A D, H E dico esse inuicem æqualia, trahantur rectæ AH, BG, CF, DE, AF, B E, quia A H portio æqualis est B G, dempta AH reposita BG,erit rectilineum AHBG curuilineo æquale,& idem de alio CFDE, sed rectilineum AHBG curuilineo æquale,& idem de alio C F D E, sed rectilineum CFDE in eadem basi cum rectilineo ABFE, & ABFE in eadem cum A H B G, ergo inuicem æqualia per 36. 1. Euclid. ergo &c.

Paral-

Parallelogramma semicuruilinea in eisdem parallelis constituta, & ex diuersis circumferentijs videlicet duplis dari possunt rectilineis æqualia.

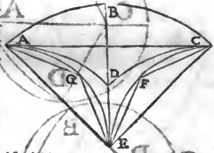
Prop. 16.



SIt parallelogrammum semicuruilineum E A B C F D E, & sit portio CBA dupli, subdupli autem semicirculus F D, dico quadrari posse, trahatur linea C A, & F D, D E, quia duæ portiones subdupli F D, D E valent quantum vna subdupli CBA, dematur C B A, reponantur duæ subdupli F D, D E, rectilineum E A C F D valet quantum semicuruilineum.

Triangulum tricuspidale quadrare.

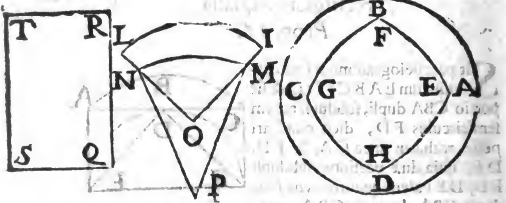
Prop. 17.



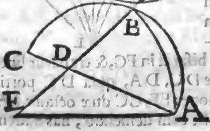
EX quarta nostri secundi repræsentetur figura AB C F E G, à medio A C trahatur linea BE, & linea E B signetur in linea B E, linea C D ex eadem dupli circumferentia, idem ex altera parte, dico triangulum tricuspidale ADCFEGA quadrari posse, diuidantur EC, EA bifariã in FG, & trahatur lineę E F, F E, E G, G A, sic, & lineæ D C, D A, quia D C portio est octaua pars sui circuli, portiones EF, GC duæ octauæ subdupli æquipollent vnam dupli, sic eam demendo, has addendo,

do, trapezium EFCD rectilineum respondet curuilineo EFCD, idem de alia parte dicendum, & multifariam potest euenire.

Coronas quadrare. *Prop. 18.*

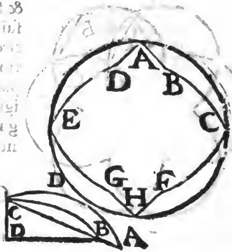


SIt quadranda Corona ABCDEFGH, pono eius quadrantem ILO, & ibi comparem octauā partem circuli dupli MNE, tollatur cōmune MNO, remanet tricuspidale triangulū quadrilaterū MONP æquale quartę parti coronę IMLN, quæ æqualis ABEF, quadruplicetur cuspidale triangulū, & erit ipsius area QRST æqualis coronæ propositę.

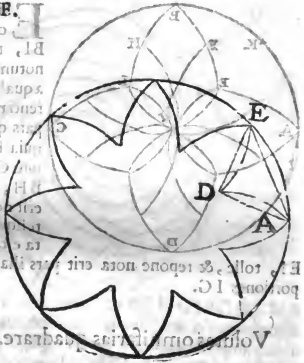


Eodem modo quarta pars semicirculi dupli ABE absumit dimidium circuli ABC subduplum, tollatur commune triangulū ABD, remanet ADE triangulum rectilineum æquale Lunæ AB, & circuli BDC, quo duplato æquipollet coronę ABCD. Sit

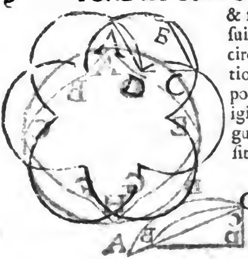
Sit portio ADCB; æquipollet dimidiæ duplæ BCD, tollatur commune BC, remanet triãgulum BCD æquipollens semilunulæ ABCD, sic quatuor triãgula BFGD absumunt coronam CBADEGHF.



Per quartam nostri secundi quadratur triangulum curuilineum ADE per rectilineum quadrangulum ABCD, sex igitur eiusmodi quadrãgula totam coronam absorbent.

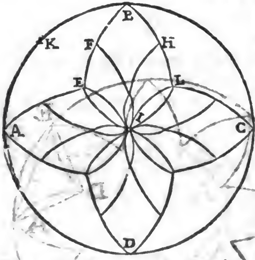


Eodem modo alia coronæ species quadratur, & sit eius pars AED, cuius maior circulus AE sit duplus AD,



& sit A D octaua pars sui circuli, & A E sui circuli, duæ igitur portiones A D, D E æquipollent vni maiori: octo igitur eiusmodi triangula respondent propositæ coronæ.

Corona semiquadranda.



Esto circulus ABCD cuius quadrans ABI, triangulum ABE notum est, quia AE, E B æquales sunt circumferentiæ A K, K B, reliqua pars quarta E F B H L I, quia B F, B H æquales sunt G F, G H, tolle F B, B H, repone G F, G H erit nota pars F B, H G, reliqua pars E F, I G nota est, quia æqualis E F, E I, tolle, & repone nota erit pars illa, remanent ergo 4. portiones I G.

Volutas omnifarias quadrare. Prop. 19.

Est voluta figuræ species in cocleæ medium sinuata, cuius ambiens perpetuo flexu ductus binis in se quo-

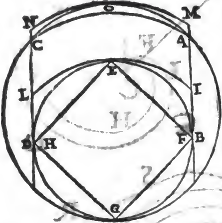
dammo-

dammodo recuruis, & refractis lineis.

Propositum ergo sit quadrare volutam BEDGIFCHLMA scio hanc volutam octauam esse partem volutæ circuli NOPQRS, & omnes circuli volutæ non capiunt nisi octogoni aream, ergo vnaquæque octauam partem com-

plectitur: vna igitur volutæ pars est BEDGIFCHLMA est octaua circuli pars, & octaua circuli pars est triangulum ABG, ergo tota proposita voluta quadrata triangulo metitur. Possumus, & hoc modo cyssoidem triangulum etiam quadrare, quod vidimus in 5. propositione huius.

Curuilinea triangula aliqua quadrare. Prop. 20.



Sit circulus duplus AMNC, subduplus vero EFGH, seq. in puncto contingant G abscindantur à duplo duæ portiones quadrati CN, AM, & à subduplo quatuor quadrati E F, FG, GH, HE remanent vacua CDEBA, BMG, GNH æqualia quadrato E F, G H puncto E ducatur parallela CA, & sit L O quadrangulum C L A I notum est, remanent quatuor triangula L D E, EIB, AMO, CNO puncto dupli circumferentia ducatur MN, & ex punctis C A alia parallela eiusdem circumferentiæ CA, dico lunulam C O A quadrari posse triangula N C O, OAM nota sunt, quadrangulum N C M A notum, quia ex parallelis circumferentijs, à quo si triangula subducantur C O A lunula nota remanet.

Quomodo lunæ cornicula quadrari possint. *Prop.* 21.

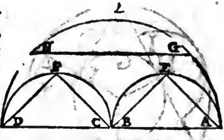
Remaneat superior descriptio, & in semicirculo B G D describatur dupli circumferentia BLID à punctis BD, lunula igitur

BG-

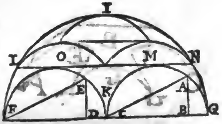
BGADILB nota est, lunula parua nota est CGA, quadrangulum CLAI notum etiam ex anteriori, remanent ergo corniculi CBL, AID etiam noti.

Trapezia multa curuilinea quadrare.

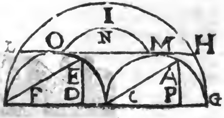
Prop. 22.



POssumus quadrare Trapezium AGNDFCBEA, quia semicirculus AGND est quadruplus AEB per 20. nostri, duo semicirculi AEB, CFD valent quantum arbilon AGNDCBA, demarur portio GN quarta circuli pars, & 4. portiones AE, EB, CF, FD, remanent duo triangula rectilinea AEB, CFD æqualia trapezio curuilineo iam dicto.

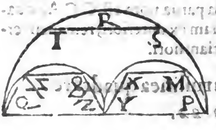


Eadem ratio erit in trigono. sit trigoni portio LIN, & duo circuli FED, CAG, à quibus duæ portiones FE, CA, & duæ dimidiæ ED, AG, quæ vnam integrant, altera erit OIM, arbilon FLINGMCO valet duos semicirculos, à quibus si tres dempseris portiones, tres item ab arbilone, vacua FLO, OKM, MNG, NMI, IOL valent duo trigona FED, CAB.

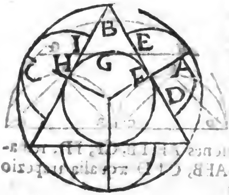


Eadem ratio erit in exagono, & trigono, nam in trigono in circulo GHILF, duo trigona APC, DEF, æquipollent vacuis GHM, MOC, OLF, HILONM, & in exagono PSRTQ,

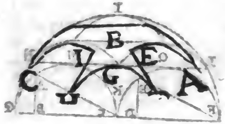
duo



duo semiexagona P M X N, & Z 8 & Q, valet vacuum P S T Q Y Z, sini linea H L, tangens circumferentiam circulorum est latus trigoni æqui lateri per 12.13. Eucl.



Circulus A B C, est quadruplus D A B, ergo pars tertia circuli A B C, quæ est A B C, est unius circuli, & tertiæ partis, pars eius tertia est F G H, reliquum ergo erit corona A B G H G F, dematur duo quadrantes circuli A E F, C H I, remanet vacuum AEFGHICBA, quantitatis dimidij circuli, & quia



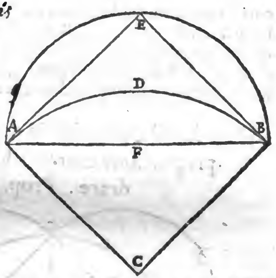
octaua pars circuli maioris, valet quatuor minoris dematur portio B ex maiori, & 4. 8. ex minori L M, M N, N O, O P, ergo rectilineam LMNOP, valet trapezium AEFGHICBA.

IO. BAPT. PORTAE NEAPOLITANI ELEMENTORVM CVRVILINEORVM

Liber Tertius.

In quo de Circuli quadratura agitur.

Lunulam ex dupla,& ſubdupla proportione quadrare. Prop. *1.*



DEſcripto dupliciſ circuli quadrãte his characteribus diſtinguatur ADBC, cuius ſubtenſam A B, ſcinde bifariam,& pun ctus ſciſſionis adamuſſim medius F charactere ſortiatur, in quo circini pede infixo ex FA interuallo circum ducto ſemiambitum ſubdupli AEB ducito, aio triangulum rectilineum ABC interceptæ lunulæ areæ AEBD æqualem eſſe. In medio periferiæ ſubdupli E punctus inſtituendus, & ab vtraque circuli extremitate A B lineæ excurrant vſque ad E, ibique mutuo concurrant, quia dupli portio A D B F quarta ſui circuli pars valet quantum duæ ſubdupli portiones A E, E B, etiam ſui circuli pars quarta (per 20. primi noſtri) ideo

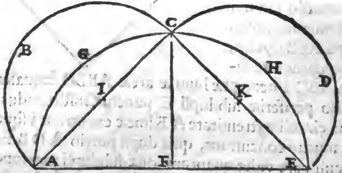
ſubductis portionibus A E, E B appoſita A D B (per primum axioma noſtri ſecundi libri) triangulum ABC valet quantum lunula AEBD, quod erat demonſtrandum.

Hyppocrates hoc aliter probat in primo Phyſicorum Ariſtotelis, quia quadrans dupli ADBC valet quantum ſemicirculus ſubdupli AEB, abſciſſa portione communi A D B, quæ inter vtrumque interiecta eſt, remanet trimetrum A B C æquale lunulæ AEBD, quadrandæ.

Conſectarium.

EX hoc circumferentia dupli tranſibit ſemper per extremitates diametri ſubdupli, quod in alijs non euenit; quia angulus in ſemicirculo A E B rectus eſt (per 31. 3. Euclid.) quadrata A E, E B æqualia ſunt quadrato A B, & quadrantis dupli angulus ACB etiam rectus eſt, ergo quadrata AC, CB æqualia ſunt quadrato AB, ob id recta linea ſubtenſa quadrantis dupli eadem eſt cum diametro ſubdupli.

Duas lunulas æquales in dupla, & ſubdupla proportione exaratas ſeorſim quadrare. Prop. 2.



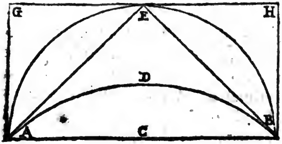
Eodem modo hoc commodiſſime abſoluemus. Eſto circulus

culus dupli A C E, & diametri extremitatibus A E binæ lineæ in medium circuli anfractum excurrant, & vbi mutuo contactu angulum efficiunt, illic C litera exaretur. Subtensæ AC, CE in medio ductu præcidantur, præfixis literis I K, mox assumpto circino ad rem commodè proferendam, pede vno in I infixo subsistente I A interuallo linea circumducatur vsque donec ad alteram extremitatem C perueniat, inuariatoq. circini pede K puncto compari linearum perscriptione circuli semianfractum designet A D E. Hoc peracto puncto F lineæ in plano iacentis perpendicularis extollatur, quæ in cuspide curuaturam C contingat, aio lunulas A B C G, C D E H, æquales esse trimetro A C E. Quoniam circulus A C E duplex est A B C, C D E, ergo semicirculus A B C, C D E æquales sunt semicirculo A C E, amputentur duæ communes portiones A G C, C H E, residua rectilinea triangula A C F, F C E æqualia sunt lunulis ABGC, CDEH vel modo, quo supra præcepimus triangulum dupli A G C F æquale est semicirculo ABC, & triangulum F C H E æquale semicirculo C D E, subductis communibus portionibus AGC, C H E, triangulum A C E, est æquale duobus lunulis A B G C, C D E H.

Consectarium.

Antequam vltra progrediar consentaneum duxi adnotandum angulum rectum A C E bifariam dissectum in C ex (per 8. 6. Euclid.) E C, ad C A rationem habet vt E F ad F A, & sic triangulum C F E ad triangulum C A F (per primum 6. Euclid.) & quia æqualia sunt, lunulæ quoque æquales sunt.

Vacans ſpacium, quod intra figuras omnes notas interuenerit quadrare. Prop. 3.



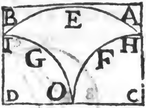
REcta linea AB dirigenda eſt, & ab eius vmbilici medio puncto C ſemiorbis circumducendus eſt A E B, completo ſemiorbi A C B, lunula complenda eſt more A E B D, mox laterales lineæ erigendæ ab extremitatibus A B ſunt, & medio eius puncto E ſuperior linea exaretur ipſi A B æquidiſtant, vt vltro, citroq. ſemicirculum tangant, etiam hiſce lateribus parallelogrammum exprimant AGHB, demum ab extremitatibus A B, medio puncto E tranſuerſas lineas ſortiatur A E, E B. Quoniam parallelogrammum GABH ſemicirculum continet, & eſt ſui quadrati *dimidium*, ſemicirculus lunulam continet AEBD, & lunula *AEBD ſuo* triangulo AEB æqualis eſt, & triangulum AEB ſui parallelogrammi dimidium eſt, ergo interceptæ areolæ AGE, EHB, ADB, quæ lunulam A B ambiunt, æquales ſunt ipſi lunulæ areolæ, ergo ſui amplexantis parallelogrammi dimidium ſunt.

Conſectarium.

EX hoc perſpicuum eſt lunulam ſui quadrati partem eſſe quartam; nam ſi lunula ſui obſepientis parallelogrammi dimidium eſt, & parallelogrammum ſui quadrati dimi-

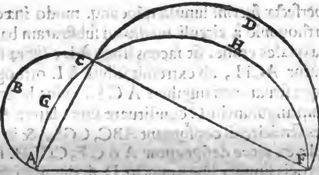
dimidium; igitur lunula ſui quadrati dimidium erit.

Vel ſi cuiuſcunque figuræ notæ vacua quadrare velimus modo ſupra cognito nota figura circumclaudatur, quam ſi à nota ſubtrahes, optato potieris ex ſecundo axiomate (ſecundi noſtri) ſit gratia exempli pelecis HEIGOF ſæpienda ſuo parallelogrammo ABCD, quam ab ipſo ſeduces, ſic incluſæ areæ HAE, EBI, IGOD, OCHF reſiduum innoteſcet.



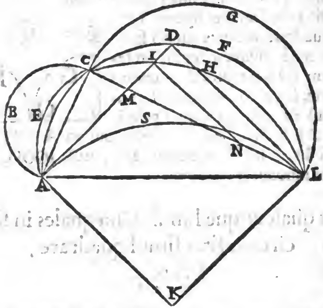
Duas quaſcunque lunulas inæquales in ſemicirculo ſitas ſimul quadrare.

Prop. 4.



Triangulum rectilineum inſemicirculari linea definiri debet, quod tribus notis diſtinximus ACE, ſupra eius latera ſemicirculi incubabunt ABC, CDE, quibus congruens area adinuenienda eſt, inquam angulus ACE in ſemicirculo rectus eſt, & bini ſemicirculi ABC, CDE æquales ſunt ſemicirculo AGCHE ex eis, quæ ſupra habita ſunt, reiectis communibus portionibus AGC, CHE relictæ ſemilunulæ ABCG, CDEH reſiduo triangulo ACE rectilineo æquiparantur.

At



At si perfectæ fuerint lunulæ quocunq. modo inæquales, semper orthogonio à circuli medio ad substratam basim deducendo æquales erunt. sit iacens linea A L, supra semicirculus struatur ACFL, ab extremitatibus A L orthogonium quodcunque struatur triangulum A C L, cuius laterum ductum rectum angulum in C constituant supra latera AC, CL, Ambientes semicirculi consurgant ABC, CGL, & in eis perfectæ lunulæ ex more designentur A B C E, CGLH. His peractis in verticis sinuosæ lineæ puncto D ab diametri extremitatibus A L duo latera consurgant, vt orthogonium triangulum ADL constituant, aio dictas perfectas lunulas ABCE, CGLH, in circulo A C D F L descriptum semper dicto triangulo ADL æquales esse: Quoniam lunulæ A B C E, CGLH æquales sunt triangulo orthgonio A D L semper ex secunda huius.

Potest & alia probandi ratio suscipi. Triangulo A D L super lineam AL descripto, aliud triangulum æquale infra lineam AL designetur, & sit ALK, & puncto K circini pede

fixo,

fixo, altero vago in A collocato sinuosa linea ducatur vsque ad L. Quoniam duæ lunulæ perfectæ ABCE, CGLH æquales sunt vni lunulæ ASL (ex prima huius) & lunula ACDFLS est æqualis triangulo AKL, quod idem est cum triangulo ADL.

Consectarium.

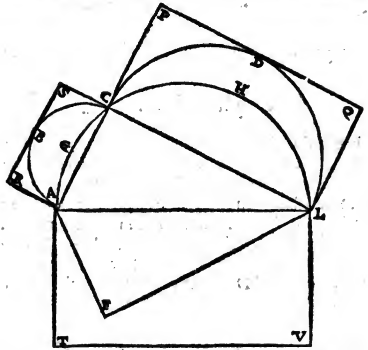
Ex hoc animaduertendum imperfectæ lunulæ quanto magis à semicirculi vertice declinant, tanto minores fieri, vt in triangulo ACL videre est, quod triangulo ADL minus est, & qui defectum conspicere quæsierit, triangulum ACM à triangulo MDL subducat hoc modo, à linea MD, linea MC præcidat, & à linea ML lineam MA obtruncet, & lineam MN ducat, triangulum MIN æquale erit ACM, reliquum triangulum IDN erit quantitas lunulæ ID ML, dempta lunula AEC.

Vacua inter lunulas intermissa quadrare.

Prop. 5.

At vero interuenientia vacua circa lunulas si quadrare quæsieris, ita quadrabis. Esto minor lunula ABCG, maior CDLH imperamus semicuruilinea triangula inania inter illas, in rectilineas figuras reddere scilicet CPD, DQL, CHL, ARB, BSC, AGC, circumscribantur parallelogrammata tangentia earum ambientes lineas PQCL, ARSC, & fiat alterum parallelogrammum ex binis AL, TV, & sit ALTV, & fiat triangulum ACL æquale AFL (per 31. primi Euclid.) quibus ita dispositis inquam vacuum circa ATVLF æquale esse imperatis vacuis.

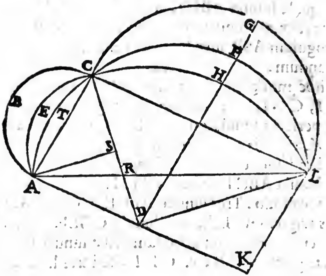
cuis. Quoniam triangulum A F L est æquale A C L ex



constitutione,& triangulum ACL est æquale lunulis CDLH, & A B C G, ergo si triangulum A F L à parallelogrammo A T L V abstuleris, reliquum vacuum A T V L F erit æquale interiectis vacuis iam recensitis.

Duas lunulas inæquales in semicirculi ambitu descriptas seorsum quadrare. Prop. 6.

ESTO rectangulum triangulum A C L, cuius porrectius latus C L sit duplum exilioris AC, & circumferantur lunulę ex more,quibus adijce suas literas indices, C G L F, & A B C T, mox parallelogrammum constituatur ex lateribus



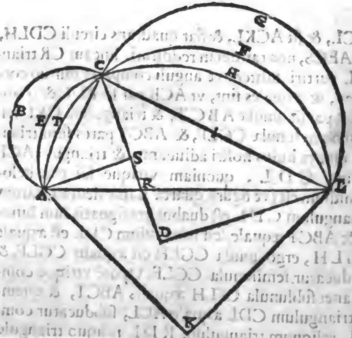
ribus AC, CL, & fit ACKL, & fiat quadrans circuli CDLH, & ſubdupli AECS, nos rationem reddituri, lineam CR triangulum ACL partiri taliter, vt anguli compares mutuo correſpondentes, & æquales ſint, vt ACR par ſit RDL & triangulum A C R par ſit lunulæ A B C T, & triangulum CRL ipſi CGLF. Quoniam lunulæ CGLF, & ABCT pares ſunt triangulo ACL quarta huius noſtri adiuuante, & triangulo ACL par trimetrum C D L, quoniam vtrique ſui parallelogrammi dimidium eſt (vt figura quarta huius demonſtratum eſt) ergo triangulum C D L eſt duabus præſignatis iam lunulis CGLF,& ABCT æquale,ſed triangulum CDL eſt æquale lunulæ C G L H, ergo lunula CGLH eſt æqualis CGLF, & ABCT ſubducatur ſemilunula CGLF, vtpotè vtrique communis, remanet ſublunula CFLH æqualis ABCT, & quemadmodum triangulum CDL æquale ACL, ſubducatur commune C R L, reliquum triangulum R D L reliquo triangulo ACR æquale,lunularũ partium repręſentantia,ſequitur trian-

K gulum

gulum RDL esse æquale sublunulæ C F L H, & triangulum ACR æquale lunulæ ABCT, à quo si triangulum ACS subtrahatur, æquale lunulæ ABCE (per primam huius) remanet subtriangulum ASR imæ lunulæ A E C T par, quod erat demonstrandum.

Vel hoc modo si triangulum A C L æquale est lunulis A B C T, C G L F, compleatur triangulum C R L, & compleatur perfecta lunula, quę sit CGLH, ergo addita pars trianguli RDL æqualis erit additæ lunulæ CFLH, sed pars trianguli addita RDL æqualis est triangulo A C R, vt vidimus, & par est lunula ABCT lunulæ CFLH.

Vel hoc modo. Tres lunulæ ABCE, CGLF, AECT sunt æquales trigono ACL, & duæ lunulæ CGLF, CFLH trigono C D L, ergo omnes quatuor iam dictæ lunulæ sunt æquales duobus trigonis A C R, & C D L, sed tres lunulę A B C E,

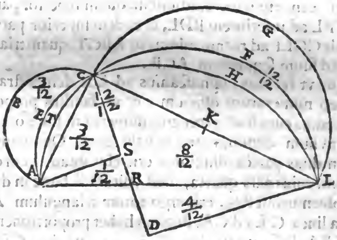


CGLF, LFCH sunt æquales trigono ALK, ergo reliqua lunu-

lunula A E C T est æqualis trigono A S R, quod quærebamus.

Vel tres lunulę A B C E, AECT, CGFL æquales sunt trigono ACL, & trigonum CDL æquale lunulę CGLH, tolle triangulum CDL ęquale iam dictę lunulę CGLH, reliquum triangulum ACR lunulis ABCE, AECT æquale est, tolle lunulam perfectam A B C E sub lunula A E C T sub triangulo A S R æqualis erit, quod erat demonstrandum.

Trianguli in circulo descripti angulo per medium discisso, & lunulis à circulo medio diuisis, proportio partis maioris trianguli ad minorem, est sicut superior pars maioris lunulæ ad inferiorem, & superior eadem pars ad minorem lunulam, & superior pars trianguli ad inferiorem sequitur eam suarum lunularum. Prop. 7.



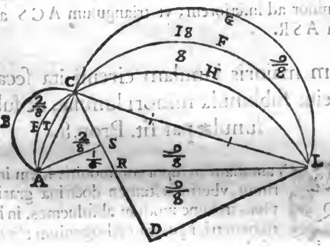
Priusquam ad diuersarum partium rationem lunularum

 descen-

descendamus, admonitione dignum censemus, quod cum ab æqualitate duarum lunularum descendimus, quam (in secunda parte) vidimus, quantum maior crescit, tantum altera decrescit, & ex alterius defectione altera augumentū suscipit, & circulus ille, qui per medium vtriusque percurrit, à maiori semicirculo subripit, & minori addit, sed id non temerè, sed certo se superant excessu, vt ratio maioris superioris lunulę ad inferiorem eadem sit, quam maioris superioris trianguli pars ad inferiorem, & ratio maioris superioris lunulę ad totam minorem, vt ratio partis trianguli anterioris ad posteriorem, eandem sequuntur analogiam, & vtraque vtriusq; rationem sequitur, vt exemplis patebit. Triangulum rectangulum strue, cuius angulis appinges literas ACL, productius latus CL in duas partes, angustius in vnam partiri. In puncto bifariæ scissionis lateris CL signa K, ex quo, & interuallo CK circinationis arcus exaretur, cui suas indices literas applicabis CGL, eodemq; ordine signa AC suum arcum delinea ABC, mox triangulum maioris circuli CGL constitues, & sit CDL, & minoris ABCE, sit ACS supra succumbentem omnium basim AL, medius circulus flectatur ACFL, dico lunulam superiorem maioris circuli CGLF ad suam inferiorem CFLH, eandem habere rationem, quam superior pars trianguli CRL ad inferiorem RDL, & eadem superior pars lunulę maioris CGLF ad totam minorem ABCT, quam triangulum CRL ad suum sequentem ACR.

Quod vt facilius cognoscamus ad hoc demonstrandum adhibeo numerorum officium, & vt facilius proportiones obseruemus cum fractis integros numeros in fractiones soluamus, vt vnum denominatorem habeamus. Quoniam lineam CL in duas partes diuisimus erit eius quadratum quatuor partium, cuius pars quarta, idest vnitas est, hanc in duodecimas soluemus, idest $\frac{12}{12}$, erit ergo totum triangulum ACL $\frac{48}{12}$, & quia linea CL ad CA, duplam habet proportionem, ita RL ad RA, & sic triangulum CRL ad triangulum CAR, ergo

triangulum CRL erit $\frac{8}{12}$, & triangulum ACR $\frac{4}{12}$. Ergo tota lunula perfecta CGLH $\frac{12}{12}$ erit superior lunula maioris circuli CGLF cum duabus lunulis ABCT simul iunctæ sunt $\frac{12}{12}$. Triã- gulum CDL erat $\frac{12}{12}$, si superior pars erat $\frac{8}{12}$ inferior RDL erit $\frac{4}{12}$, & quia tota perfecta lunula CGLH est $\frac{12}{12}$, vt proportio quadrupli seruetur, quam habet ad minorem perfectam ABCE $\frac{3}{12}$, & triangulum ACS erit ei par $\frac{3}{12}$; inferior ergo pars $\frac{1}{12}$, & cum nullus melior congruat sublunularum partibus sit sublunula AECT $\frac{1}{12}$, sic superior pars maioris lunulæ $\frac{8}{12}$ inferior $\frac{4}{12}$. Vnde proportio trianguli superioris CRL ad inferiorem BDL, erit dupla, vt superior maioris lunulæ pars CGLH ad inferiorem etiam dupla, idest $\frac{8}{12}$ ad $\frac{4}{12}$, & proportio superioris lunulæ pars CGLF ad lunulas ABCT etiam dupla est, sed superior minor lunula ad inferiorem tripla est, vt $\frac{3}{12}$ ad $\frac{1}{12}$, sic triangulum superius ACS ad ASR, vt $\frac{3}{12}$ ad $\frac{1}{12}$.



Subijciatur aliud exemplum in tripla diuisione supra lineam porrectam AL, circulum effingamus ACFL, mox in eo triangulum describendum, vt rectus angulus C literam possideat, cuius latus vnum longius CL tres partes, minus AC, vnam sortiatur in struendis ibi commodè semicirculis CGL

maior,

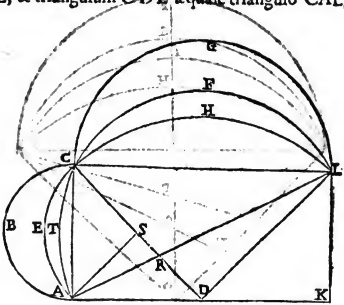
maior, ABC minor. Inde perfectæ lunulæ ex ordine subsignentur, idest trianguli CDL, CGLH, trianguli ACS, ABCE.

Triangulum ACL, quia linea est trium partium, area erit [illegible], proportio CRL ad ACR est tripla, ob id triangulum CRL erit [illegible], & triangulum ACR [illegible], triangulum CDE latus trium est partium, quadrans est nouem partium, cuius quarta pars est $2\frac{1}{4}$, idest [illegible] supra sunt trianguli CRL [illegible], ergo triangulum RDL erit [illegible], tres lunulæ ABCE, AECT, CGLF est [illegible] superior maior ad duas minores est tripla, ergo lunula superior est [illegible], & duæ lunulæ ABCE, AECT est [illegible], sed lunula perfecta est [illegible], ergo superius triangulum CAS [illegible] subditum reliqui erit [illegible] & sublunula reliqua [illegible] inferior maior lunula, vt compleat numerum [illegible] erit [illegible], ergo proportio lunula superior ad inferiorem, idest CGLF ad CFLH sicut triangulum CRL ad RLD, & lunula EGLF ad lunulas ABCT, & superior lunula minor ad inferiorem, vt triangulum ACS ad triangulum ASR.

Datam maioris lunulam circuli ita secare, vt eius sublunula minori lunulæ, & sublunulæ par sit. Prop. 8.

Qvamquam in supra commonitis idem indicauerimus, vberioris tamen doctrinæ gratia exemplum in hunc modum absoluemus. in hanc rationem triangulum orthogonium eligendum est ACL, cuius porrectius latus CL bifariam dispescemus, supra lunulas ex more constituemus, & medium circulum ATCFL, & eis triangula subijciemus CDL, ACR, mox datis lineis AC, CL parallelogrammum constituatur CALK, inquam sublunulam CFLH, lunulis ABCT æqualem esse. Quoniam lunula CGLH æqualis est suo triangu-

lo CDL, & triangulum CDL æquale triangulo CAL, quia

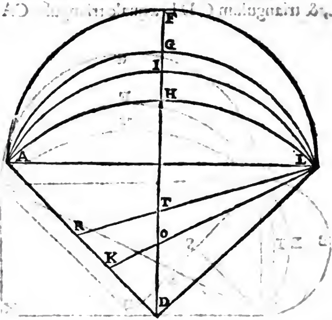


vtrumque est æquale suo parallelogrammo dimidio CALK, & triangulum ACL est æquale lunulæ CGLF, & lunulis ABCT, ergo lunula CFLH est æqualis lunulis ABCE, & AECT, tollatur de medio lunula CGLF, remanebit sublunula CFLH æqualis ABCT, quod erat discutiendum.

Datam dupli, & subdupli circuli lunulam ad imperatas partes discindere.

Prop. 9.

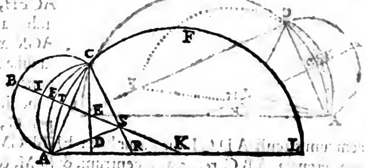
Esto dupli, & subdupli multifariam scindenda lunula AFLH, cuius subtensa AL, sui compar triangulum inferius substituemus ADL à medio inflexi circuli vertice F vsq; ad trianguli aciem infernè positam D recto ductu descendat. In dextro trianguli latere AD futuræ lineæ designandæ sunt lunulam



nulam diuisuræ in quotcunque partes volueris decem, vel septemdecim, pro nunc bifariam in R dispescito, & transuersam ad L deducito, si velis lunulæ mediam partem auferre, & vbi se lineæ cum diametri linea decussabunt, fige circini pedem fixum, & vagum alterum ad alterutrius diametri extremitatem A, vel L, arcum circumflecte A G L, nam lunula AFLG erit dimidium lunulæ. Vel si tertiam partem vis auferre, sit latera K in laterali tractu tertia pars ab K ad L lineam porrigito, & vbi FD lineam secat, pede circini stabili collocato, ac vago altero ad A extremum, arcum circumduces A I L, & tertiam lunulæ partem A I LH à duobus abscindet. Quoniam triangulum ADL per RL lineam bifariam dissectum est, superior trianguli pars ARL per superexaratam propositionem superiori lunulæ parti AFLG congruit, & ima trianguli pars RDL imæ lunulæ parti correspondet, & vtræq. partes sunt, ergo & lunulæ eis pares dissectæ sunt: Idem de tertia parte dicendum.

Eadem

Eadem in parua lunula operaberis, nam si bifariam ABC lunulam vis partiri trianguli eius ABS latus, AS bifariam in D, & latus à D quousque ad punctum C perueniat protrahe-



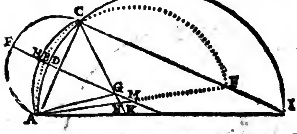
mus, & lineam à B medio semicirculi, punctoq. S, vsque ad circuli ATCFL centrum perueniat, & vbi se intersecabunt puncto E siste circini pedem, & Interuallo EA, extende circulū AIC, & diuisa erit lunula: probatio ex anteriori liquet.

Datam quamcumque lunulam quadrare. Prop. 16.

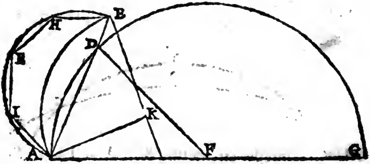
Esto exposita quadranda lunula ABCD cuiuscunque ordinis, cui æquale oportet reperiri rectilineū, maior cir-

culus GADCH, integer circinetur, & sit ADCI porrecto suo diametro AI, & à puncto A superponatur præfata lunula ABC, & compleatur circulus ABCF cum suo diametro AF, extendaturq. linea à puncto A ad C, & sit AC, discindaturq. rectus angulus ACI per rectam CK, & super basim AC circinetur semicirculus AEC, & puncto G, basi AC, fiat quadrans

dupli,& ſit AHCG, & trahatur A G, G C. Quoniam triangulum A C G eſt æquale lunulæ ACEH, remanet ſubtriangulnm AGK æquale ſub lunulæ AHCD. à puncto ſemicirculi medio E, AEC per G, vſque ad centrum circuli A D C I, dirigatur linea EHBDGML ex circumferentia A B C reperiatur centrum, & ſit M, & trahatur A M, vſque ad F diametri finem ex ſupradictis, ſi à triangnlo AGK, quod lunulam AHCD refert, ſubducatur AGM, quod repręſentat lunulam A H C B, remanet ſubtriangulum ANK repręſentans ſublunulam ABCD, quod erat edocendum.



Semilunulas ex nota ratione quadrare. Prop. 11.



IN ſola proportione dupli, & ſubdupli accidit, vt ſemidiameter circuli ſubdupli ſit æqualis ſubtenſæ quadrantis dupli, vt in prima Prop. huius vidimus : ideo in his perfectæ lunulæ, & alijs potius circuli ſemilunulæ dici poſſunt.

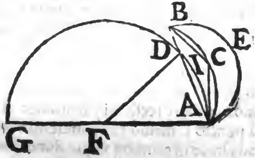
Eſto

Eſto circulus ADG quadrans ſemicirculi AEB, & quarta pars ſemicirculi A D G ſit A D F, & diameter ſubdupli ADB tranſeat per punctum D, dico triquetrum A D F ſemicirculo AEDB æquale eſſe. Tollatur communis portio DA, remanet lunula AEBD, æqualis triangulo FDA, ſed AEBL perfecta lunula nota eſt: ergo ſublunula A L B D nota erit, ſubducito triangulum D B K ab A K F, reſiduum ſublunulæ A L D B notum erit.

Poteſt & alio modo cognoſci. Portio quadrupli AD valet quatuor portiones ſubquadrupli, ſecetur circumferentia AEB quadrifariam, & ſint portiones AI, IE, EH, HB, amputentur portiones AI, IE, EH, HB, reponatur AB, trapezium rectilineum AIEHBD notum erit, & ſic de cæteris.

Alio modo.

SIt ſemicirculus A D G, quadruplus ipſius A E B, & ipſius AEB, capiatur duplus, & ſit circumferentia ACB, remaneat infra ſublunula A C B D I A, quam volumus quadrare. Quia ſemilunula ACBDIA, nota eſt, &

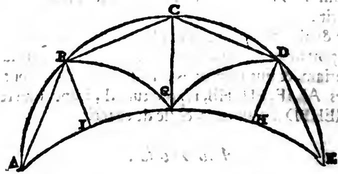


nota etiam lunula AEBC, ex vigeſima ſexta primi noſtri, ſi notum à noto ſubtrahatur, quod reliquum eſt notum erit.

Poſſumus etiam proximè prædicto modo quadrare, quia portio A D, eſt dupla ipſius A C B, diuidatur A C B, in duas partes AC, CB, demantur hæ duæ portiones AC, CB, reponatur A D, rectilineum A C B D A, eſt æqualæ ſublunulæ A C B D I A.

Lunulam per latum in quadrabiles partes diuidere. Prop. 12.

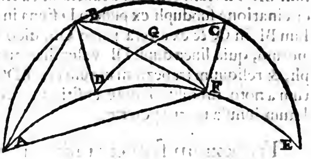
Nunc me conuertam ad quadrandas lunularum in latum partes, cùm paulò ante per longum indicauerimus.



mus. Esto lunula AECG, diuidaturq. per medium per lineam CG, & AC circumferentiam per medium proscindes in B, & ex aduersa parte CE in D, & inuariata circini apertura semicirculi subdupli pes vagus in A, alter fixus sistatur taliter, vt ex B voluatur in G, & fit circumferentiæ circumductio B G, eodemq. ductu definiatur intercapedo G D similis BG, mox protrat recta ad partitiones AB, BC, CD, AG, GE, & à puncto I, medio circumferentiæ AG, erige lineam sursum ad circumferentiam vsque donec eam in B tetigerit. Quoniam A B est æqualis B G, & portio A G dupli rependit duas AB, BG semidupli, dico illis AB, BG sublatis, hac AG reposita, rectilineum triangulum A B G notum erit, idem intelligendum de altera partitione G D E, reliquum triangulum BCDG notum erit, vt residuum notæ lunulæ. Vel amputatis portionibus BC, CD, repositis his BG, GD æquales, & eiusdem circumferentiæ, recensitum triangulum notum erit. Ex his triangula ABG, BCDG, GDE per medium transuersis diuisa lineis nota erunt, & tripartita erit lunula.

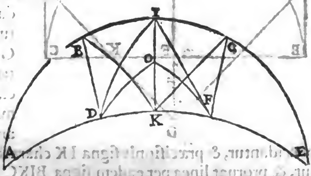
Vel

Vel circuli dupli tripartita partitione curuaturā conſtituas A D, DF, FE; Item ſubdupli AB, BC, CE; inuariataq. circini apertura intra duo puncta BF,



DC mutuo inter ſe intercidentes arcus flectantur BF, DC, & vbi futurus eſt cōtactus illic pone G, aio triangulum ABF notum eſſe, quia AF, dupli circumferentia, duobus illis ſubdupli AB, BF reſpondet; vnde reiectis illis, hac repoſita portione penſatur. Idem de alia parte DCE dicendum, & triangula BGD, CGF, BGC, DGF nota ſunt, ſic etiam triangulum BCF, & FCE dicendum.

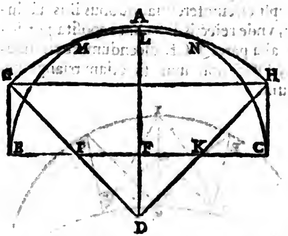
Remanente adhuc lunulę illæſa tripartitione ex puncto D fixo circini pede altero ad F ſigna in ſubduplo æqualē portionē in I, mox inuaria-



ta circini apertura, qua duplū circulū conſtituiſti, ſiſte circini pedem in altera extremitate lunulæ puta E, alterum ad D, & I conuertè, & ſigna circumferentiam dupli DI, & ab I ad F excurrat recta I F, dico triangulum DIF notum, quia circumferentia dupli DF eſt æqualis DI ex conſtitutione, ratione iam ſæpius repetita, addendo, & demendo notum erit triangulum DIF, vel intercapedine BK circinetur BK circumferentia dupli, & recta ducatur K C, quia D F eſt compar BC, & DF æqualis ipſi BK, tolle portionem BC, repone BK triangulum

lum BKC notum erit, vel deducta linea IK, & interuallo B I circinatione subdupli ex puncto D signa in linea IK interuallum BI in O, & ex altera parte OF, dico triangulum DOF notum, quia linea dupli DF valet illas duas DO, OF subdupli, & reliquum trapezium notum erit BDOFC demendo notum à noto, similibus iam recensitis modis multipliciter perlatum lunula partiri poterit.

Trapezium semicuruilineum trapezio par extruere. Prop. 13.



Esto dupli quadrans DGLH, & hinc inde à terminis G H transuersa linea ducenda est, quæ curuaturam spectet, & sit GH, mox duo latera, quæ anguli faciem in D confirmant DG, DH, amussim in medio præcidantur, & præcisionis signa I K characteribus insigniantur, & proruat linea per eadem signa BIKC ipsi GH parallela, & ex punctis G H ad perpendiculum demittantur supra BC lineæ G B, G H, & excurrentes in longum lineam BIKC bifariam diuidat, cuius diuisionis terminus F, & centro F interuallo FB, circumducatur semicirculi forma subdupli BAC, quæ quadrantis circumferentiam in duobus punctis intercidet. Intercisionis puncta totidem literas sortiantur M, N, & vniatur FD. Dico Trapezium semicuruilineum BGMLNHC par esse quadranti DGLH, sed ad demonstrationem accingamur. Quoniam FD æquidistat HC, cadit

inter

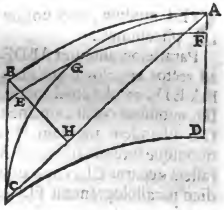
inter eas DH, ergo anguli FDK, KBC æquales anguli ad K contrapositi etiam pares. Itidem & recti ad FC, & HK linea ipsi KD etiam æqualis. Triangulum ergo FDK triangulo KHC compar. Idem ex contraria parte sentiendum, cum compari linearum descriptione confirmata sit. Demantur ergo triangula IFD, FDK reponantur GBI, KHC, trapezium semicuruilineum BGMLNHC æquipollet semicirculo BMANC.

Consectarium.

Ex his apparet lunulam MANL æqualem esse duobus triangulis MGB, NHC, quoniam circuli pars extramittitur MANL, includantur trapezij partes NHC, MGH.

Triangulum semicuruilineum ex quarta semicirculi subdupli, & octaua dupli quadrare. Prop. 14.

Sit semiabscissa lunula AGCD, & linea CB ipsi AD parallela constituatur, & dupli circumferentia AB extremitate A ipsi CD parallela ducatur, donec ductum lineæ CB contingat in B, dico semicuruilineum triangulum ABCG quadrari posse. Quoniam AB ipsi CD Parallela, & eiusdem circumferétiæ, ergo quadrangulum BACD notum est, à quo si semilunula subducatur CGAD, remanet triangulum notum ABCG.

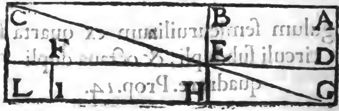


Vel

Vel quia lunula æqualis est AGF ipsi ECG ex præcedenti, parallelogrammum EBAF est notum, quia ex æqualibus circumferentijs; ergo & triangulum CBA notum est, quia vtrique additur commune GAF.

Vel triangulum semicuruilineum, quod paulò ante descripsimus ABCE remaneat, & ducatur linea CA portio semidupli CGA, & sit ABH semiportio dupli, ergo æquales, abscessus communis EHGA tollatur, remanet BEA æquale CEH, addatur vtrique communis BEC, ergo triangulum rectilineum BHC est æquale triangulo semicuruilineo BCGA.

Notum à noto subtrahere. Prop. 15.



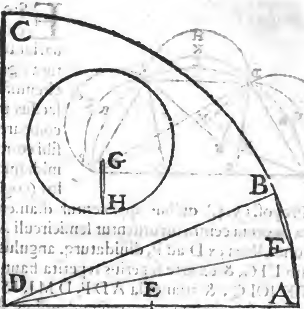
SEd modum, quo notum à noto subtrahatur nunc explicabimus.

Parallelogrammum ABDE circa decussatas lineas BH, EF ad rectos angulos constitue, & sit quantitas lunulæ datæ BAED, ex alia crucis parte HIEF, elongeturq; parallela IH, quousque coëat cum linea AD in puncto G, mox linea GE discindens angulum DGH, ducatur per coniunctum E, quousque intercidat lineam AB, & ibi appone C, & ab C, parallela ducatur CL, vsque donec lineam GHL tetigerit in L, dico parallelogrammũ FLI esse quantitatem trianguli BAC, qua superatur à parallelogrammo FH, quoniam parallelogrammum BD est æquale parallelogrammo EL, dempto parallelogrammo FH, residuum erit FL, quod quærimus.

Circu-

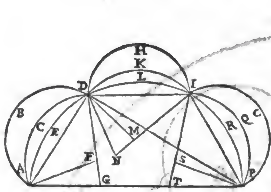
Circulum quadrato proximum constituere.

Prop. 16.



ABsoluta lunularum tractatione venio tandem ad circuli æquadrationem ex ingenij facultate, sed initio circuli quadrationi approximabimur. Esto sexto decupli circuli quadrans A, B, C, & ex semidiametri dimidio D E, sub sexto decuplus circulus constituatur G H, amputetur pars quadrantis ADG, sitq. DBA, dico triangulum DBA circulo mutua parilitate constare fecetur arcus quadrantis BA bifariam in F, connectanturq. rectè BF, FA, & à circulo G H itidem duæ illæ portiones quadrantis BF, FA, dico triangula FDB, ADF esse æqualia circulo, demptis duobus portionibus GH, æquales illis BF, FA interclusis : quod patet ex constructione.

Datum circulum quadrare. Prop. 17.



Esto expositus circulus A D I P, inuariataq. circini apertura signetur in circuli circumferentia tres abscessus tres. n. recipiet compares, & coæquales sibi correspondentes semidiametro semicirculos (cogete ad id Euclidis Propos. 15.4.) quibus applicentur diametri AD, DI, IP, supra quorum centra incuruentur semicirculi ABD, DHI, IOP, excurrat linea ex D ad P, diuidaturq. angulus A D P per lineam DFG, & ex arte superius repetita fiant lunulæ ABDC, DHIK, IOPQ, & triangula A D F, D M I, I S P cum suis sub triangulis suis sublunulis correspondentibus A F G, D N M, P S T.

Quoniam semicirculus A L P constat quatuor semicirculis æqualibus semidiametro, si tollantur tres portiones communes A E D, D L I, I R P, & tria triangula æqualia lunulis AFD, DMI, ISP, tollanturq. tres sublunulæ tribus subtriangulis respondentes ACDE, DKIL, IQPR, cum suis subtriangulis respondentibus illis AFG, NDM, SPT, vacuum reliquum intercedens rectilineum, vel trapezium G D N M I S T valet quantum semicirculus quartus relictus X Y Z, hoc inane valet semicirculus X Y Z. Absoluamus igitur circulum cum suo quadrato valente trapezium illud, & quadratus erit circulus.

Nunc

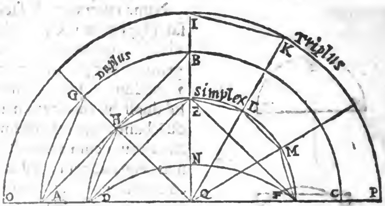
Nunc euertatur, & facessat Hyppocratis Chij fallacia circulum quadrare satagentis, quod putarat quemadmodum lunulæ dupli, & subdupli in quadratum adducebantur, ita quamcumq. circulorum cum suis rectilineis æquationem; sed eius corruit demonstratio, nam res se aliter habet: quod enim est singulare in circulis se in dupla proportione excrescentibus, dissentaneum est idem in reliquis existimare. Nos (ni fallimur) ex inuentione trianguli A F G sublunulæ aereæ A D C E respondentis, assecuti sumus.

Data portione nota, alteram cuiusq. proportionis sibi comparem peruestigare.

Prop. 18.

Esto linea O P futura basis variorum circulorum, & semicirculus O I P triplus, A B C duplus, & D E F simplex, siue subduplus, & sic de alijs alter supra alterum in quæsita ratione semper excrescens, & à puncto Q, quod medium diametri possidet angulis vtrinque æqualibus ascendat linea Q I semicirculus bifaria diuisione discendens: mox ex centro Q circumferentiam AB æqualiter partiens vsque ad C, transmittatur, ex altera parte duæ aliæ circumferentiã I P, trifariam secantes coæquentur, & sint Q K, Q M, & sit

M 2 data



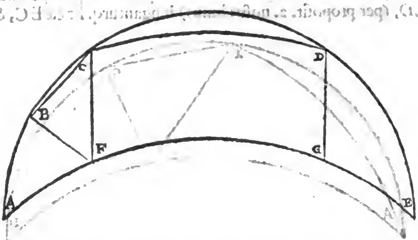
data fimplicis circuli portio DE, alteram volumus in dupla proportione æqualem inuenire. Dupli quarta A G B difcindatur bifariam, trahaturq. linea AC, & à puncto D ad E dupli portio fubpingatur. Quoniam vidimus in lunula DEFN, portionem dupli quartæ circuli DNF valere duas quartas circuli fubdupli, vel fimplicis D H E, E L F, fed portio dupli D N F eft æqualis A G B, quia eadem eft dupli quarta. Ergo area conclufa in portione dupli DNF valet duas quartas fubdupli DHE,ELF, & portio octaua dupli AG valet duas octauas fubdupli D H, H E. Idem dicendum de tripla, nam circulus O I K P eft triplus fubtripli,vel fimplicis circuli DHELF,& par fexta femicirculi tripli I K, valet tres *fextas fubtripli* circuli EL, LM, MF, & fic de alijs cuiufcunque quantitatis, & incognitæ menfuræ dicendum: nam femper rata, & iufta proportio erit.

Ex portionibus circulum quadrare. Prop. 19.

EX ea, quam modo expofuimus propofitione dependet hæc portionum quadratio, quam ob oculos exponemus.

Efto propofita lunula A B C D E, ex qua (docente id 15. propof. noftri ante præteritam) minor lunula abfcindatur,

quæ



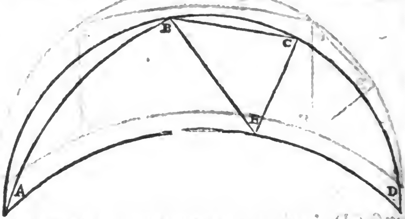
quæ sit CD, ab cuius extremitatum terminis infernè descendant perpendiculares CF, DG. Quoniam quadrangulum semicuruilineum C F D G notum est ex eisdem æqualibus circumferentijs dupli CD, GF, nota quoque est minor lunula CD, si à lunula ACDE subducatur quadrangulum notum CDGF, & lunula CD residua cornicula ACF, DGE nota erunt. Mox lineæ dupli AF subdupli compar AB reperiatur (per propositionem proximè præteritam) & erit trilaterum BFC, quod subtrahes à corniculo ABCF, & erit triangulum B C F notum. Duc lineam B C, & trilaterum rectilineum B C F notum subtrahe à semicuruilineo B C D noto, & area intra portionem BC concepta nota resultabit.

Altera.

ALiam figuram extruendam non putamus, sed superiore lunula relicta. Esto à puncto A vsque ad B duo puncta, dupli circumferentia flectatur, & sit lunula minor AB, & æq ualis AB, fiat linea AE dupli, & à puncto B ad E rectus

tra-

trames ducatur. mox lineæ ED compar ſubdupli reperiatur CD, (per propoſit. 2. noſtri huius) iunganturq. lineæ EC, &

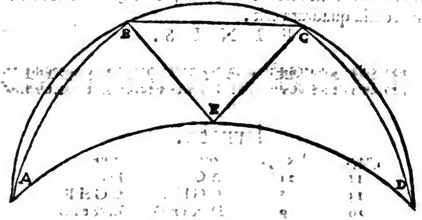


BC, recta lineam etiam connectatur. Quoniam AB, AE æquales, & eædem circumferentiæ ſunt, ſi lineæ ſubtendantur arcubus AB, AE amputata portione AB, repoſita ſuo loco AE notum erit triangulum ſemicuruilineum ABE, lunula AB nota eſt (ex propoſ. 15. præſentis noſtri) ergo lunulæ pars ABE nota erit, deme AB integram, innoteſcet reſiduum BCDE lineæ ED comparem reddidimus CD. Ergo corniculus ECD notus erit, deme à toto reſiduo BCDE innoteſcet trimetrum ſemicuruilineum BEC, appinge lineam BC à terminis BC, & triangulum rectilineum BCE notum erit, ſubducito à curuilineo, & portio BC nota erit.

Altera.

VEl in lunula ABCDE à puncto A vſque ad E, nota in ſubduplo, & ſit AB, & ex altera parte CD, & à puncto A, vſque ad B appinge lineam dupli AB, & ex altera parte CD, mox connecte lineas rectas BE, EC, BC, quia AB, AE æquales ſunt, ſic CD, DE, ergo lunulæ AB, CD etiam notæ, tolle, quia remanet par medij BEC nota, à no-

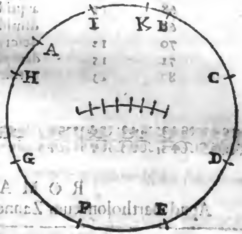
to semicuruilineo BCE, tolle rectilineum BCE, remanet no-



ta portio BC, sic & aliæ diuisiones imaginari possunt, & portiones quadrari.

Data vna portione nota, totam circumferentiam circuli quadrare. Prop. 20.

SIt propositus circulus ABCDEFGH, & sit portio nota AB, nos hanc circumferentiam metiemur septies AB, BC, CD, DE, EF, FG, GH, supererit HA, qua metiemur bis AB idest AI, IK, & supererit KB, quæ portionem IK ter mensurabit. Ergo AB septies partiemur, quibus abscissionibus suas partes addemmus: A portione igitur AB subducemus octogonum



num rectilineum, reliquum in ſeptem portiones diuidemus; ex quibus portiones tres recipiemus pro HI, & ſic tota circumferentia quadrata erit.

FINIS.

Errata.

pag.	verſ.	err.	corr.
11	21	A C	D E
13	8	C G H E	C G H P
20	9	D, & ex D	L, & ex L
23	1	vtrunque	vtcunque
23	18	A F G	A F C
23	21	F G	F B
30	1	AD	A B
32	5	hit	hic
48	15	Prop 8.	Prop 7.
49	17	repeſitiſq.	repoſitiſq.
58	7	M N B	M N P
64	20	trapeſium	trapezium
65	8	duplis	duplicis
68	15	æquidiſtant	æquidiſtans
69	1	dimidium	quarta pars.
70	12	deſcriptum	deſcriptas
71	15	dempla	dempta
87	13	Semicuruilieum	Semicuruilineum

ROMAE,
Apud Bartholomæum Zannettum. M. DC. X.

SVPERIORVM PERMISSV

Typographus amico Lectori.

IOannis Baptiſtæ Portæ V. Cl. ingenium Babylonicis palmis conſimile ſemper exiſtimaui, ex illis enim mella conficere, cibos parare, vina colligere, contexere veſtes, & ſexcenta alia ad vitam vel ſuſtinendam, vel ornandam ſibi cōparare dicuntur Aſſyrij. En tibi, amice Lector fœcundum ingenium Portæ infinita, vel ornamenta, vel adiumenta parturijt, ac elaborauit. Ad excolendum animum philoſophicas diſputationes, ac mathematicas lucubrationes; ad recreandum reficiendumq. Villam, Pomarium, & lepidiſſimas Comedias. Ad exornandum Admiranda, & alia multiplicis eruditionis volumina. Vno verbo nihil eſt in naturæ maieſtate repoſitum, Nihil in huius vniuerſi luce verſatur, quod tibi Porta non ſuppeditet. Pleriſque iam olim frui contigit, multa propediem expecta, quæ nobis omni diſciplinarum genere excultus, ac dignus longiore fælicioreq. æuo Comes Anaſtaſius de Philijs Lyncæus, & Portæ ipſi, quo cum plurima de litteris contulit, perneceſſarius, amantiſſime impertiuit. Optandum intereà eſt. vt Porta, diutius ſibi, tibi, Reipublice viuat. Vt autem vno oculorum aſpectu omnes magni viri lucubrationes agnoſcas illorum Catalogum ſubtexere viſum eſt.

In lucem iam editæ.

Phyſiognomonia Humana tum Latina, tum Italica lingua.
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Phytognomonicæ, libri octo, Lat.
Magia naturalis Lat. & Ital. primum quatuor libris, demum viginti abſoluta.
De Furtiuis litterarum notis vulgus de ziferis. libri quatuor, primum euulgati mox alio ſuperaucti.

Villa

Villa Lat. Pomarium,& Oliuetum olim seorsim, demum vno volumine libris duodecim comprehensa.

De refractione optices, libri nouem, Lat.

De Curuilineis, libri duo primum, cui additus tertius liber de Quadratura Circuli. Lat.

Interpretatio primi Almagesti cum Comm. Theonis Lat.

De munitione, libri tres, Lat.

Pneumaticorum, libri tres, Lat. Italicè spiritali: cioè d'inalzar acque per forza d'aria.

De transmutationibus aeris, libri quatuor, Lat.

De Distillatione, libri nouem, Lat.

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S. Giorgio. S. Dorotea. S. Eugenia.	Tragedie.

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Cinque Comedie d'vna fauola sola con le medesime Persone, e la prima è argomento di se, & di tutte; la seconda è protesi di se & di tutte, con la peripatia per se, e tutte; la quinta è la Catastrofe per se,& tutte insieme.

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